



Hetis 865G Series MS6255 Barebone

**Version 1.0
G52-B6255X1**

Manual Rev: 1.0
Release Date: June 2003



FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

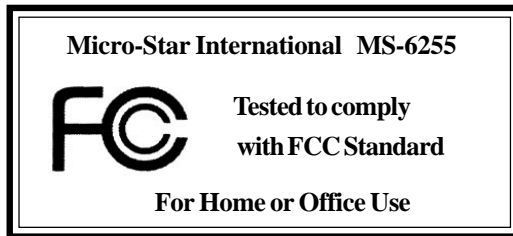
Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

Shielded interface cables and AC. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.



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Revision History

Revision	Revision History	Date
V1.0	First release	June 2003

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. **DO NOT COVER THE OPENINGS.**
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment has not work well or you can not get it work according to User's Manual.
 - The equipment has dropped and damaged.
 - The equipment has obvious sign of breakage.
12. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60°C (140°F), IT MAY DAMAGE THE EQUIPMENT.**



CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

CONTENTS

Chapter 1. Getting Strated	1-1
System Map	1-2
System Features	1-4
Thermal Solution	1-5
Power Supply	1-7
Chapter 2. Introducing Mainboard	2-1
Mainboard Layout	2-2
Quick Components Guide	2-3
Mainboard Specifications	2-4
Installing CPU	2-6
CPU Installation Procedures	2-6
Memory Installation	2-8
Introduction to DDR SDRAM	2-8
DDR Module Combination	2-8
Installing DDR Modules	2-9
DDR Population Rules	2-9
Power Supply	2-10
ATX 20-Pin Power Connector: ATX1	2-10
ATX 12V Power Connector: JPW1	2-10
Front Panel	2-11
SPDIF out Jack	2-11
Audio Port	2-11
USB Ports	2-12
IEEE 1394 Port	2-12
Back Panel	2-13
Mouse/Keyboard Connectors	2-13
Audio Port	2-14
AV-out Connector: TV1	2-14
RJ-45 LAN Jack	2-14

Parallel Port	2-15
DVI Connector: DVI1	2-16
IEEE 1394 Port: J1394-1	2-17
VGA Port	2-17
Serial Port	2-18
USB Ports	2-18
Connectors	2-18
Hard Disk/CD-ROM Connector: IDE1	2-19
FDD Connector: FDD1	2-19
Front Panel Connector: JFP1	2-20
CD-in Connector: JCD1	2-20
Fan Power Connectors: CPUFAN1/SYS_FAN1/NBFAN1	2-21
Internal Speaker Connector: CON1	2-22
On-Board S-Video out Connector: JTV1	2-22
Card Reader Connector: J3	2-22
Serial ATA Connectors: SATA1, SATA2	2-23
Jumper	2-24
Clear CMOS Jumper: JBAT1	2-24
Slot	2-25
PCI Slot	2-25
PCI Interrupt Request Routing	2-25
Chapter 3. System Assembly	3-1
Overview	3-2
Installation Tools	3-2
Screws	3-2
Installation Flowchart	3-3
Checking the Items	3-4
Installation Procedures	3-5
Chapter 4. BIOS Setup	4-1
Entering Setup	4-2

Selecting the First Boot Device	4-2
Control Keys	4-3
Getting Help	4-3
The Main Menu	4-4
Standard CMOS Setup	4-6
Advanced BIOS Features	4-8
Advanced Chipset Features	4-13
Power Management Features	4-15
PNP/PCI Configurations	4-19
Integrated Peripherals	4-22
PC Health Status	4-27
Frequency/Voltage Control	4-28
Supervisor/User Password	4-30
Optimal/Fail-Safe Defaults	4-31
Appendix: Using 4- or 6-Channel Audio Function	A-1
Installing the Audio Driver	A-2
Using 4-/6- Channel Audio Function	A-4
Testing the Connected Speakers	A-8
Playing KaraOK	A-10
Glossary	G-1

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

- Visit the MSI website for FAQ, technical guide, BIOS updates, driver updates, and other information: **<http://www.msi.com.tw/>**
- Contact our technical staff at: **support@msi.com.tw**

Getting Started **1**

Congratulations for purchasing MS-6255 barebone. The **MS-6255** barebone is your best Slim PC choice. **Based on the “all-in-one” design idea, the MS-6255 provides 2 “1394” ports (option), 6 USB ports, 2 TV-out jacks (option), 1 DVI jack (option) and 1 SPDIF jack.** With the fantastic appearance and small form factor, it can easily be set anywhere in a clean look. The feature packed platform also gives you an exciting PC experience.

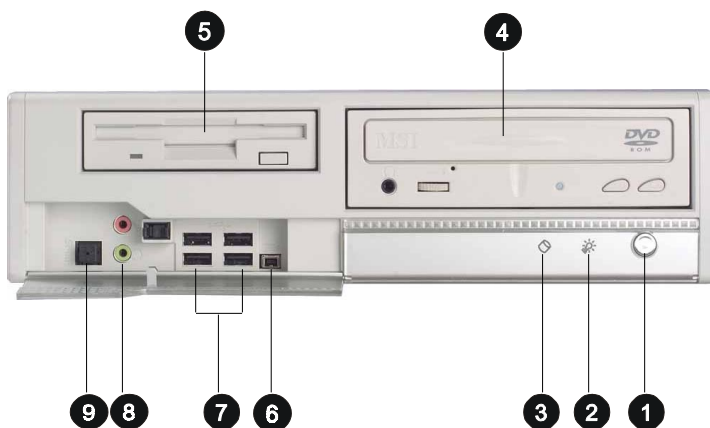
1.1 SYSTEM MAP

Chassis

- Dimension: 310mm (H) x 84mm (W) x 345mm (D)
- Minimized screw structure
- Detachable bay housing

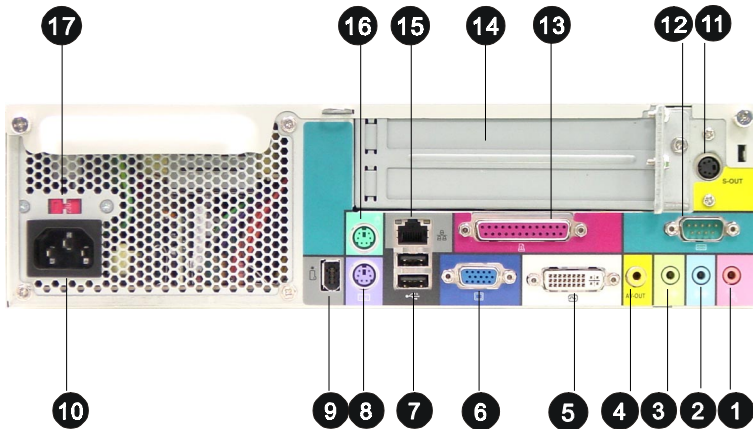


Front View



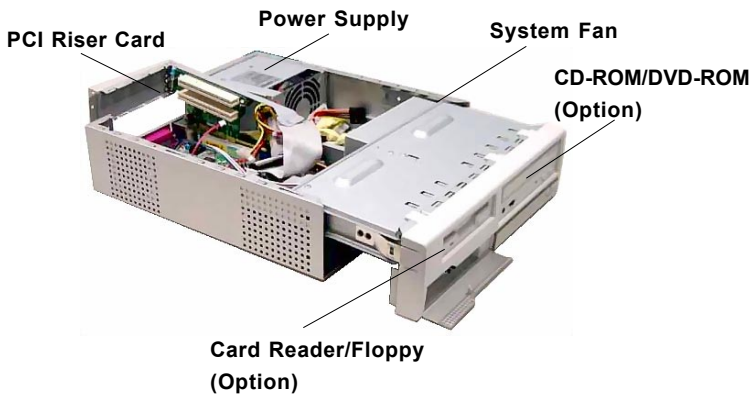
- | | |
|--------------------------------------|----------------------|
| 1. Power Switch | 7. 4 x USB 2.0 Ports |
| 2. Power LED | 8. Mic-in, Line-out |
| 3. HDD LED | 9. SPDIF out |
| 4. CD-ROM/DVD-ROM drive (Option) | |
| 5. Card Reader/Floppy drive (Option) | |
| 6. 4-Pin IEEE 1394 Port (Option) | |

Back View



- | | |
|----------------------------------|---------------------------------|
| 1. Mic-in | 10. Power Jack |
| 2. Line-in | 11. S-Video out (Option) |
| 3. Line-out | 12. COM A |
| 4. AV-out (Option) | 13. Parallel Port |
| 5. DVI Port (Option) | 14. PCI Slot |
| 6. VGA Port | 15. RJ-45 LAN Jack |
| 7. 2 x USB 2.0 Ports | 16. PS/2 Mouse |
| 8. PS/2 Keyboard | 17. Voltage Selector (115/230V) |
| 9. 6-pin IEEE 1394 Port (Option) | |

System Structure



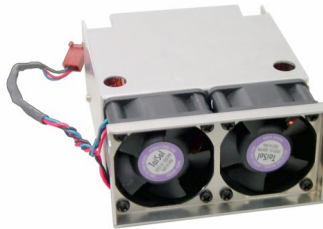
1.2 SYSTEM FEATURES

Feature	Description
Small P4 chassis	84 (H) x 310 (W) x 345 (D) mm
External Devices	1 x IDE/Serial CD-ROM/RW or DVD-ROM (Option) 1 x Card Reader/FDD (Option)
Internal Support	1 x IDE/Serial ATA HDD
Front Access	USB 2.0 x 4 4-in 1394 x 1 (Option) SPDIF out x 1 (Option)
Rear Access	LAN x 1 DVI x 1 (Option) USB 2.0 x 2 6-pin 1394 x 1 (Option) 2 TV-out: AV-out & S-video out (Option) VGA (4/8/16/32/64 MB) Parallel/PS2 x 2/COM1 Line-in/Line-out/Mic-in
Easy assembly & installation	Module design with swappable parts
Silent operation	Idle 32.3 dB
Expandability	2 available PCI slots

1.3 THERMAL SOLUTION

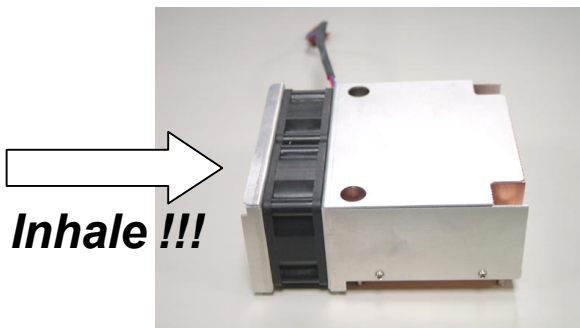
The system has good thermal solution. The specially designed CPU cooler supports CPU up to 3.0GHz and above. The system fan also effectively help to exhaust hot air through a complete air flow direction.

CPU Cooler

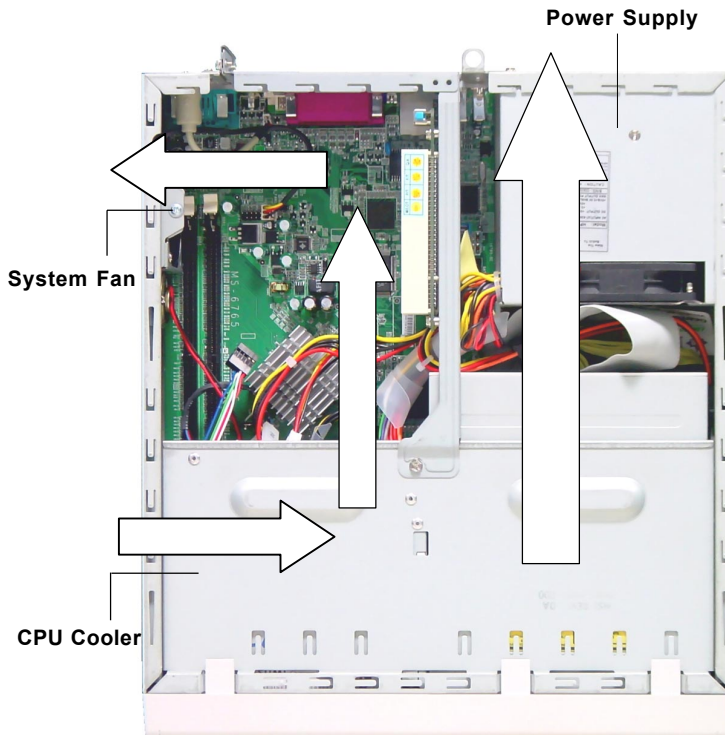


CPU Fan

Air Flow Direction



System Air Flow Direction



1.4 POWER SUPPLY



Dimension: 80 (H) x 120 (W) x 120 mm (D)

PFC: Yes

Waltage: 245~250 Max

Certificate: FCC/UL/CUL/BSMI/CB/NEMKO/TUV/CCC

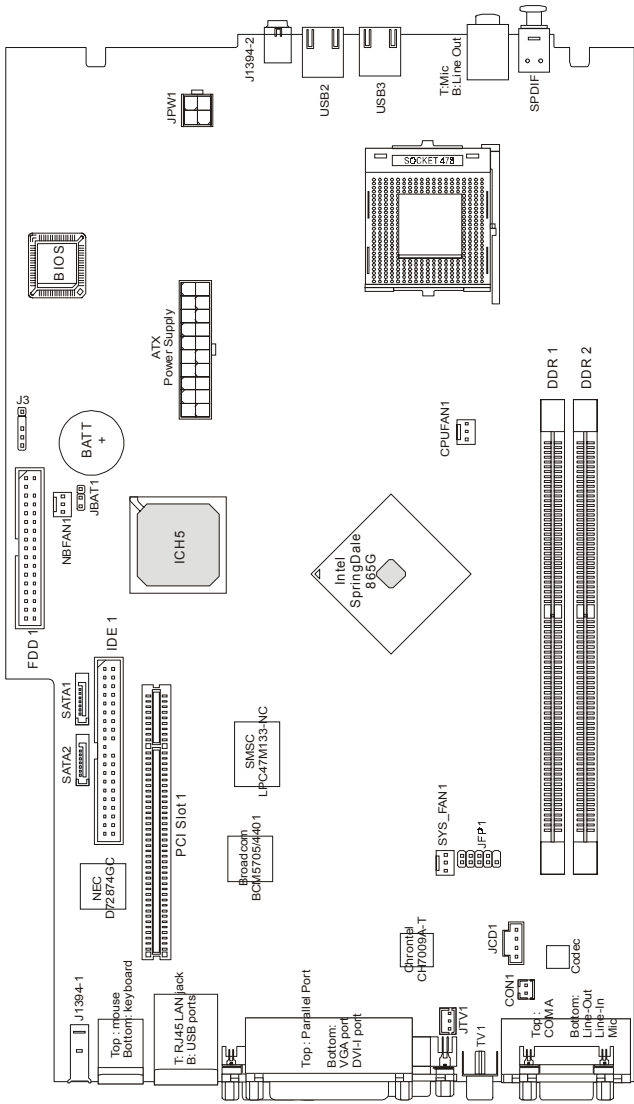
AC Output: 100~127/200~240 VAC, Switch Selectable, Auto
Protection

DC Output: +3.3V 17A, +5V 21A, +12V 13A, -12V 0.8A, +5Vsb
2A

Introducing Mainboard **2**

This chapter mentions the information about MS-6765 mainboard. Each component's function and pin definition are introduced to provide you with the complete information about mainboard feature. Read this chapter carefully before assembling the system.

2.1 MAINBOARD LAYOUT



MS-6765 (V1.X) Mainboard

2.2 QUICK COMPONENTS GUIDE

Component	Function	Reference
Socket 478	Installing CPU	See p. 2-6~2-7
DDR1 & DDR2	Installing DIMM modules	See p. 2-8~2-9
ATX Power Supply	Connecting to 20-pin ATX power supply	See p. 2-10
JPW1	Connecting to 12V ATX power supply	See p. 2-10
IDE1	Connecting to HDD/CD-ROM	See p. 2-19
SATA1 & SATA2	Connecting to Serial ATA device	See p. 2-24
JFP1	Connecting to Front Panel	See p. 2-20
JCD1	Connecting to CD-ROM audio	See p.2-20
CPUFAN1/SYS_FAN1/ NBFAN1	Connecting to System/CPU/North Bridge fan	See p.2-21
FDD1	Connecting to FDD	See p. 2-19
JTV1	Connecting to S-Video	See p. 2-22
JBAT1	Setting clear CMOS	See p. 2-25
J3	Connecting to OPTIONAL Card Reader	See p. 2-22
CON1	Connecting to built-in internal speaker	See p. 2-22
PCI Slot1	Connecting to PCI card	See p. 2-25

2.3 MAINBOARD SPECIFICATIONS

CPU

- Supports Socket 478 for Intel® Pentium™ 4/Northwood/Prescott processor up to 3 GHz and above

Chipset

- Intel® 865G chipset
 - Supports FSB 800/533/400 MHz
 - Supports integrated graphics
 - Supports DDR 400/333/266 memory interface
- Intel® ICH5 chipset
 - Hi-Speed USB (USB2.0) controller, 480Mb/sec, 8 ports
 - 2 Serial ATA/150 ports
 - 2 channel Ultra ATA 100 bus Master IDE controller.
 - PCI Master v2.3, I/O APIC
 - Supports both ACPI and legacy APM power management

Main Memory

- Two 184-pin DDR DIMMs (Dual Channels).
- Supports DDR 400/333/266 memory up to 2GB.

Slot

- One 32-bit PCI bus slot
- Can connect 2 PCI card through riser card

On-Board Peripherals

- Rear Panel
 - 1 parallel port
 - PS2 keyboard + PS2 mouse
 - 2 USB ports
 - Rear Audio (Mic_in, Line_in, Line_out)
 - 1 VGA port
 - 1 LAN (RJ45) port
 - 1 DVI connector for LCD monitor (Optional)
 - 2 TV out connectors: AV out & S-video out (Optional)
 - 6-pin 1394 connector (Optional) x 1
 - 1 serial port (On-board)

- Front Panel
 - 2 audio ports (Lin-out, Mic_in)
 - 4 USB ports
 - 1 SPDIF out
 - 4-pin 1394 connector (Optional) x 1
- Internal Pin-Header
 - CPU fan & system fan
 - Clear CMOS pin-header
 - 1 standard floppy connector
 - 1 IDE connector
 - Audio (CD-in)
 - On-board buzzer
 - 1 to 2 PCI riser card
 - 2 SATA connectors
 - 1 optional card reader connector

Audio

- AC'97 link controller integrated in ICH5
- Realtek ALC650 6-channel audio
- Compliance w/AC'97 v2.2 spec.

On-Board Communication

- LAN/Modem: Broadcom4401(10/100)/BCM5705 GbE (Option)

On-Board Graphics

- Integrated

BIOS

- Winbond/SST Firmware Hub 4M

Dimension

- 325mm (L) x 195mm (W), 6 mounting holes, 4-layer proprietary form factor

2.4 INSTALLING CPU

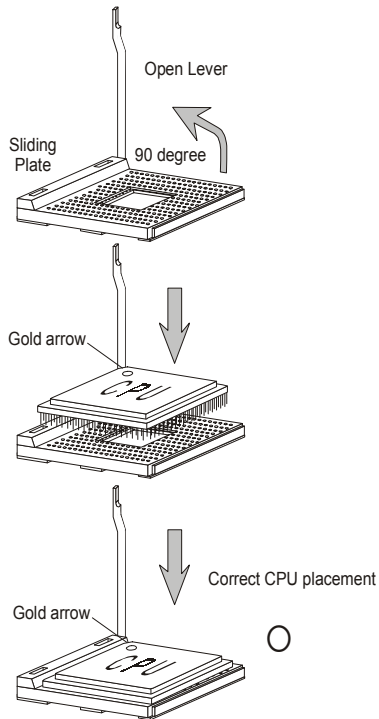
The mainboard supports **Intel® Pentium™ 4/Northwood/Prescott processors**. The mainboard uses a CPU socket called Socket 478 for easy CPU installation. The Hetis 865G has its specific CPU cooler that is included in the package. Follow the procedures as below to install the CPU. You can also refer to p. 3-7 for more information.

CPU Installation Procedures

1. Turn off the power and unplug the power cord before installing the CPU.

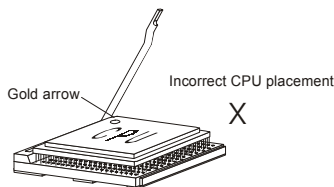
2. Pull the lever sideways away from the socket. Make sure to raise the lever up to a 90-degree angle.

3. Look for the gold arrow. The gold arrow should point towards the lever pivot. The CPU can only fit in the correct orientation.



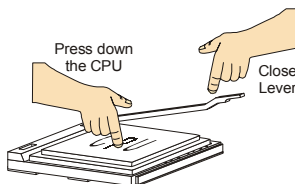
4. If the CPU is correctly installed, the pins should be completely embedded into the socket.

Any violation of the correct installation procedures may cause permanent damages to your mainboard.



5. Press the CPU down firmly into the socket and close the lever.

As the CPU is likely to move while the lever is being closed, always close the lever with your fingers pressing tightly on top of the CPU to make sure the CPU is properly and completely embedded into the socket.



Overheating

Overheating will seriously damage the CPU and system, always make sure the cooling fan can work properly to protect the CPU from overheating.

Replacing the CPU

While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from grounded outlet first to ensure the safety of CPU.

2.5 MEMORY INSTALLATION

The mainboard provides two sockets for 184-pin DDR SDRAM DIMM (Double In-Line Memory Module) and supports the memory size up to 2 GB. You can install PC3200/DDR400, PC2700/DDR333 or PC2100/DDR266 modules into the DDR DIMM slots.

Introduction to DDR SDRAM

DDR (Double Data Rate) SDRAM is similar to conventional SDRAM, but doubles the rate by transferring data twice per cycle. It uses 2.5 volts as opposed to 3.3 volts used in SDR SDRAM, and requires 184-pin DIMM modules rather than 168-pin DIMM modules used by SDR SDRAM. Three types of DDR are available at the time of writing: PC2100, PC2700 and PC3200. High memory bandwidth makes DDR an ideal solution for high performance PC, workstations and servers.



DDR1 DDR2

DDR Module Combination

Install at least one DIMM module into the slots. Memory modules can be installed into the slots in any order. You can install either single or double-sided modules to meet your need.

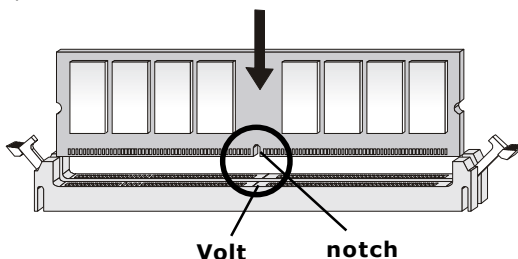
Slot	Combination	
	1	2
DDR 1	S/D	S/D
DDR 2	S/D	S/D
Total Memory	64MB~2GB	64MB~2GB

S (Single Side): 64MB ~ 512MB

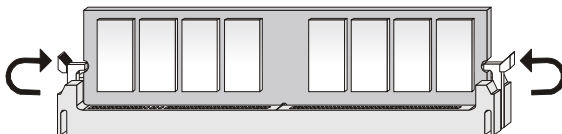
D (Double Side): 128MB ~ 1GB

Installing DDR Modules

1. The DDR DIMM has only one notch on the center of module. The module will only fit in the right orientation.
2. Insert the DIMM memory module vertically into the DIMM slot. Then push it in.



3. The plastic clip at each side of the DIMM slot will automatically close.



NOTE: Refer to p. 3-7 for more information.

DDR Population Rules

Install at least one DIMM module on the slots. Each DIMM slot supports up to a maximum size of 1GB. Users can install either single- or double-sided modules to meet their own needs. Please note that ***each DIMM can work respectively for single-channel DDR, but there are some rules while using dual-channel DDR*** (Please refer to the suggested DDR population table on p. 2-8). Users may install memory modules of different type and density on different-channel DDR DIMMs. However, the ***same type and density memory modules*** are necessary while using dual-channel DDR, or instability may happen.

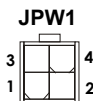
2.6 POWER SUPPLY

ATX 20-Pin Power Connector: ATX1

This connector allows you to connect to an ATX power supply. To connect to the ATX power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector. The power connector supports **instant power on** function which means that system will boot up immediately when the power supply connector is inserted on the board.

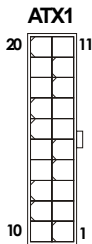
ATX 12V Power Connector: JPW1

This 12V power connector is used to provide power to the CPU.



JPW1 Pin Definition

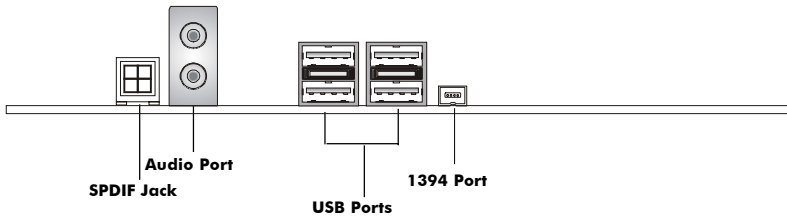
PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V



ATX1 Pin Definition

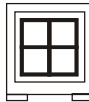
PIN	SIGNAL	PIN	SIGNAL
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PS_ON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PW_OK	18	-5V
9	5V_SB	19	5V
10	12V	20	5V

2.7 FRONT PANEL



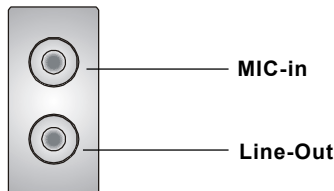
SPDIF out Jack

The connector allows you to connect to Sony & Philips Digital Interface (SPDIF), developed jointly by the Sony and Philips corporations. A standard audio file transfer format, SPDIF allows the transfer of digital audio signals from one device to another without having to be converted first to an analog format.



Audio Port

This allows you to connect the front audio device



USB Ports

The mainboard provides an UHCI (Universal Host Controller Interface) Universal Serial Bus root for attaching USB devices such as keyboard, mouse or other USB-compatible devices. You can plug the USB devices directly into these connectors. The mainboard supports USB 1.1 & 2.0 devices.

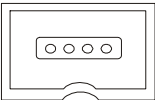


USB Port Description

PIN	SIGNAL	DESCRIPTION
1	VCC	+5V
2	-Data 0	Negative Data Channel 0
3	+Data0	Positive Data Channel 0
4	GND	Ground
5	VCC	+5V
6	-Data 1	Negative Data Channel 1
7	+Data 1	Positive Data Channel 1
8	GND	Ground

IEEE 1394 Port

The mainboard provides two IEEE 1394 ports. This smaller one is designed for you to connect the IEEE 1394 device with external power. The IEEE 1394 high-speed serial bus complements USB by providing enhanced PC connectivity for a wide range of devices, including consumer electronics audio/video (A/V) appliances, storage peripherals, other PCs, and portable devices.

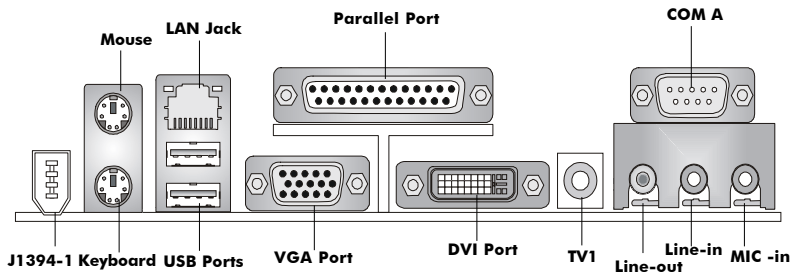


Software Support

IEEE 1394 Driver is provided by Windows® 98 SE, Windows® XP, Windows® ME and Windows® 2000. Just plug in the IEEE 1394 connector into the port. These Operating Systems will install the driver for IEEE 1394.

2.8 BACK PANEL

The Rear Panel provides the following connectors:

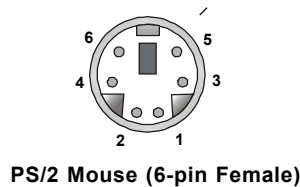


Mouse/Keyboard Connectors

The mainboard provides two standard PS/2® mini DIN connectors for attaching PS/2® mouse and keyboard.

Pin Definition

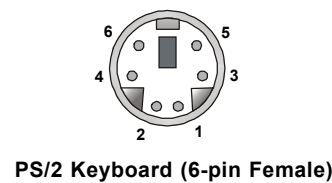
Pin Definition		
PIN	SIGNAL	DESCRIPTION
1	Mouse DATA	Mouse DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Mouse Clock	Mouse clock
6	NC	No connection



PS/2 Mouse (6-pin Female)

Pin Definition

Pin Definition		
PIN	SIGNAL	DESCRIPTION
1	Keyboard DATA	Keyboard DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Keyboard Clock	Keyboard clock
6	NC	No connection

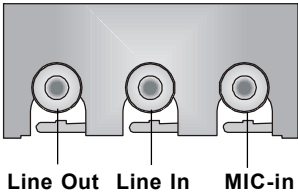


PS/2 Keyboard (6-pin Female)

Audio Port

Line Out is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic-in** is a connector for microphones.

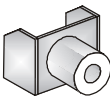
1/8” Stereo Audio Connectors



***NOTE:** The mainboard supports 4- or 6- channel audio function. For more information, refer to Appendix.*

AV-out Connector: TV1

You can connect to a TV or video device to TV1 connector for video-out function which allows you to output the image to a TV or video device.



TV1
Connector



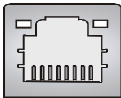
TV



Projector

RJ45 LAN Jack

The mainboard provides one standard RJ-45 jack for connection to Local Area Network (LAN). You can connect a network cable to the LAN jack.

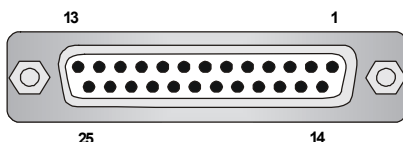


Pin Definition

PIN	SIGNAL	DESCRIPTION
1	TDP	Transmit Differential Pair
2	TDN	Transmit Differential Pair
3	RDP	Receive Differential Pair
4	NC	Not Used
5	NC	Not Used
6	RDN	Receive Differential Pair
7	NC	Not Used
8	NC	Not Used

Parallel Port

The mainboard provides a 25-pin female centronic connector as LPT. A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.

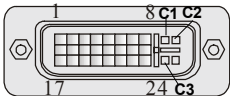


Pin Definition

PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	Paper End
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select In
18	GND	Ground
19	GND	Ground
20	GND	Ground
21	GND	Ground
22	GND	Ground
23	GND	Ground
24	GND	Ground
25	GND	Ground

DVI Connector: DVI1 (Digital Output Only)

The mainboard provides a DVI (Digital Visual Interface) connector which allows you to connect an LCD monitor. The DVI connector provides a high-speed digital interconnection between the computer and its display device.



DVI-I Connector			
Pin		Signal Assignment	
1	T.M.D.S. * Data2-	13	T.M.D.S. Data3+
2	T.M.D.S. Data2+	14	+5V
3	T.M.D.S. Data2/4 Shield	15	GND (for +5V)
4	T.M.D.S. Data4-	16	Hot Plug Detect
5	T.M.D.S. Data4+	17	T.M.D.S. Data0-
6	DDC Clock	18	T.M.D.S. Data0+
7	DDC Data	19	T.M.D.S. Data0/5 Shield
8	N/C	20	T.M.D.S. Data5-
9	T.M.D.S. Data1-	21	T.M.D.S. Data5+
10	T.M.D.S. Data1+	22	T.M.D.S. Clock Shield
11	T.M.D.S. Data1/3 Shield	23	T.M.D.S. Clock+
12	T.M.D.S. Data3-	24	T.M.D.S. Clock-
C 1	Analog Red		
C 2	Analog Green		
C 3	Analog Blue		

*T.M.D.S. Technology
The graphics data sent to the digital monitor use Transition Minimized Differential Signalling (T.M.D.S.) technology. TMDS uses an encoding algorithm to 8-bit of data into a 10-bit transition minimized, DC balanced character, which are transition-minimized to reduce EMI with copper cables and DC-balanced for transmission over fiber optic cables. The TMDS algorithm also provides robust clock recovery for greater skew tolerance with longer cables or low cost short cables.

- No analog output in this model.

IEEE 1394 Port: J1394-1

The bigger 6-pin IEEE 1394 Port on the back panel is designed for you to connect to IEEE 1394 devices without external power. That means the mainboard can provide the power for the devices connected to this port.



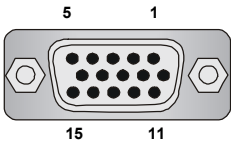
Software Support



IEEE 1394 Driver is provided by Windows® 98 SE, Windows® XP, Windows® ME and Windows® 2000. Just plug in the IEEE 1394 connector into the port. These Operating Systems will install the driver for IEEE 1394.

VGA Port

The mainboard provides one DB 15-pin female connector to connect a VGA monitor.



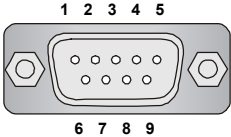
DB 15-Pin Female Connector

Pin Definition

Analog Video Display Connector (DB-15S)	
PIN	SIGNAL DESCRIPTION
1	Red
2	Green
3	Blue
4	Not used
5	Ground
6	Ground
7	Ground
8	Ground
9	Power
10	Ground
11	Not used
12	SDA
13	Horizontal Sync
14	Vertical Sync
15	SCL

Serial Port

The mainboard offers one 9-pin male DIN connector as serial port. The port is 16550A high speed communication port that sends/receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.

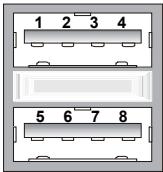


9-Pin Male DIN Connector

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicate

USB Ports

The mainboard provides an UHCI (Universal Host Controller Interface) Universal Serial Bus root for attaching USB devices such as keyboard, mouse or other USB-compatible devices. You can plug the USB device directly into the connector. The mainboard supports USB1.1 & 2.0 devices.



USB Ports

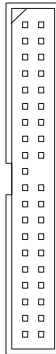
PIN	SIGNAL	DESCRIPTION
1	VCC	+5V
2	-Data 0	Negative Data Channel 0
3	+Data0	Positive Data Channel 0
4	GND	Ground
5	VCC	+5V
6	-Data 1	Negative Data Channel 1
7	+Data 1	Positive Data Channel 1
8	GND	Ground

2.9 CONNECTORS

Hard Disk/CD-ROM Connector: IDE1

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA 33/66/100 controller that provides PIO mode 0~4, Bus Master, and Ultra DMA/33/66/100 function. The connector on the mainboard allows you to connect to the IDE devices: HDD & CD-ROM.

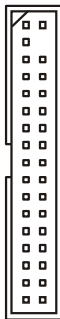
IDE1



FDD Connector: FDD1

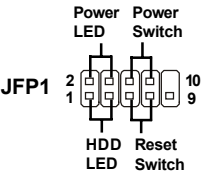
The mainboard provides you with a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types

FDD1



Front Panel Connector: JFP1

The mainboard provides one front panel connector for you to connect to the front panel switches and LEDs. JFP1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

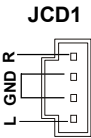


JFP1 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	HD_LED_P	Hard disk LED pull-up
2	FP PWR/SLP	MSG LED pull-up
3	HD_LED_N	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW_N	Reset Switch low reference pull-down to GND
6	PWR_SW_P	Power Switch high reference pull-up
7	RST_SW_P	Reset Switch high reference pull-up
8	PWR_SW_N	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.

CD-in Connector: JCD1

The connector is for CD-ROM audio connector.



Fan Power Connectors: CPUFAN1/SYS_FAN1/NBFAN1

The CPUFAN1 (CPU fan), SYS_FAN1 (system fan) and NBFAN1 (North Bridge Cooler fan) support system cooling fans with +12V that is controlled by PWM.

When connecting the wire to the three-pin head connectors, always note that the red wire is the positive and should be connected to the +12V (that is controlled by PWM), the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

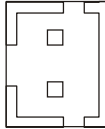


NOTE: *The NBFAN1 connector is provided by default. If you want to add cooler onto the North Bridge, you need to connect cable to the connector.*

Internal Speaker Connector: CON1

This connector is used to connect the **built-in internal speaker**.

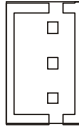
CON1



On-Board S-Video out Connector: JTV1

The mainboard provides a TV-out connector for you to connect to a TV or video device.

JTV1



Card Reader Connector: J3

This connector is used to connect the OPTIONAL card reader.

J3



(USB 2.0 interface)

Serial ATA Connectors: SATA1, SATA2

The southbridge of this mainboard is ICH5 which supports two serial connectors SATA1& SATA2.

SATA1 & SATA2 are dual high-speed Serial ATA interface ports. Each supports 1st generation serial ATA data rates of 150 MB/s. Both connectors are fully compliant with Serial ATA 1.0 specifications. The Serial ATA connector allows you to connect the hard disk device of Serial ATA interface.

SATA1 & SATA2 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	TXP
3	TXN	4	GND
5	RXN	6	RXP
7	GND		

SATA1/SATA2

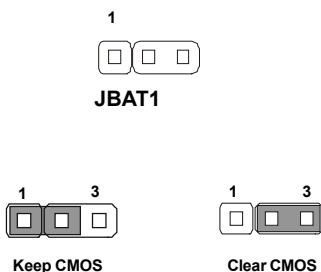


2.10 JUMPER

The motherboard provides one jumper for you to set the computer's function. This section will explain how to change your motherboard's function through the use of the jumper.

Clear CMOS Jumper: JBAT1

There is a CMOS RAM on board that has a power supply from external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. That battery has long life time for at least 5 years. If you want to clear the system configuration, use the JBAT1 (Clear CMOS Jumper) to clear data. Follow the instructions below to clear the data:



You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

2.11 SLOT

The mainboard provides one 32-bit Master PCI bus slot.

The PCI slot allows you to insert PCI Riser Card. The PCI Riser Card is included in the MS-6255 barebone. The Riser Card allows you to insert two expansion cards. You can insert any type of PCI cards to meet your needs.

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to make any necessary hardware or software settings.



PCI Slot 1

PCI Riser Card



PCI Interrupt Request Routing

The IRQ, abbreviation of interrupt request line and pronounced I-R-Q, are hardware lines over which devices can send interrupt signals to the microprocessor. The “AGP/PCI” IRQ pins are typically connected to the PCI bus INT A# ~ INT D# pins as follows:

	Order 1	Order 2	Order 3	Order 4
1394	INT D#			
PCI Slot	INT B#	INT C#	INT D#	INT A#

System Assembly 3

This chapter provides you with the installation procedures of the MS-6255 barebone. It is useful for you to read the information of mainboard setup before assembling the whole system.

3.1 OVERVIEW

The built-in MS-6765 mainboard is designed for MS-6255 barebone only. Except MS-6765 mainboard, the built-in components of MS-6255 barebone include power supply and PCI riser card. In this chapter we'll show you how to install CPU, FDD/Card Reader, HDD, CD-ROM and CPU Cooler.

Installation Tools



Screw Driver



Gloves

Screws

Four types of screws are used by MS-6255 barebone: round-headed screw, hexagonal screw with washer, thumb screw and flat-headed screw.



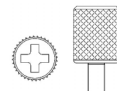
Round-headed screw: This type of screw is used to attach the HDD to the chassis.



Hexagonal screw with washer: The screw is used to fasten the mainboard, riser card and CD-ROM to the chassis.

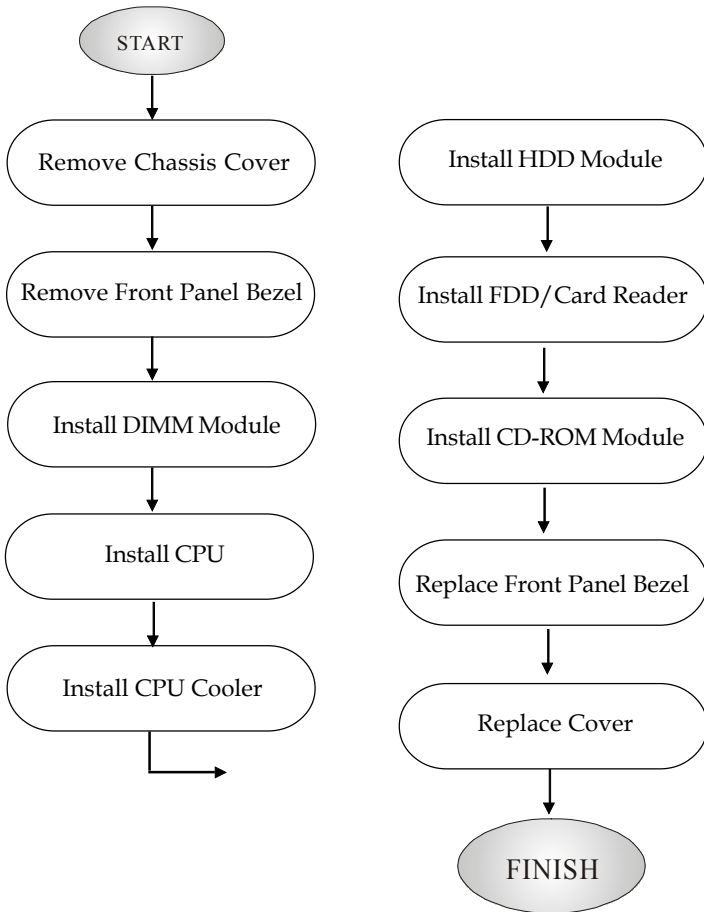


Flat-headed screw: This type of screw is used to fasten the standard FDD and card reader to the Front Panel Bezel.



Thumb screw: This type of screw is used to fasten the cover to the chassis.

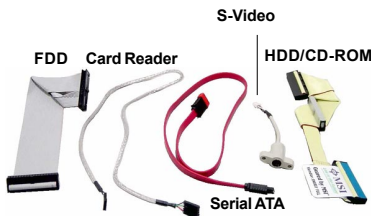
Installation Flowchart



Checking the Items

Before assembling your system, check the items that are used. *Some items are included in packing whereas some are not.* Check with your dealer for the real and complete packing list.

The Cables



CPU Cooler



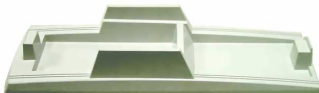
Riser Card



HDD Tray



Footstand



CD-ROM Module (Option)



FDD Module (Option)





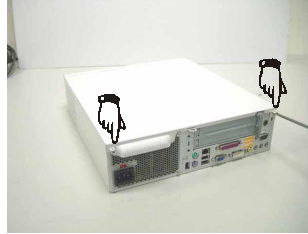
Card Reader (Option)



3.2 INSTALLATION PROCEDURES

1. Removing Cover/Riser Card/Front Panel Bezel

Remove the two thumb screws   on the cover.



Use your two hands to remove the cover.



Remove the screw   on the back panel to release the riser card.



Remove the screw   on the Front Panel Bezel to release the riser card.



Chapter 3

Remove the riser card.



Press the place indicated to release the bracket of Front Panel Bezel.



Release the Front Panel cable from the connector.

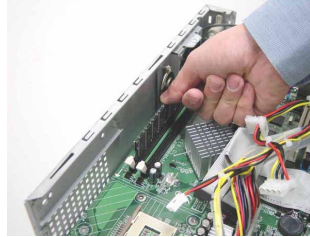


The Front Panel Bezel has been released.

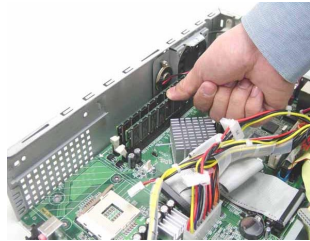


2. Installing RAM/CPU/CPU Cooler

Install the DIMM module.
(Refer to p. 2-9 for more information.)



The plastic clip at each side of the DIMM slot will automatically close.

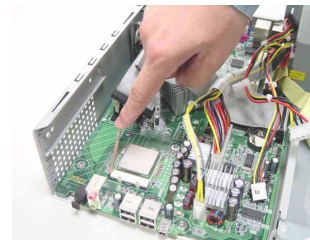


Locate the CPU socket. Pull the lever away from the socket and raise it up to 90-degree angle. Put the CPU onto the socket.

NOTE: Make sure the pins are completely embedded into the socket. The CPU can only fit in the correct direction.

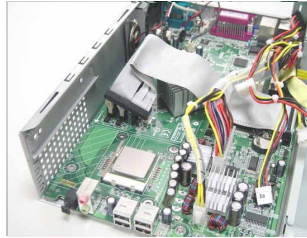


Close the lever to complete the installation.

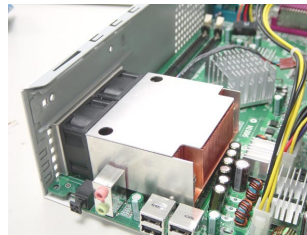


Chapter 3

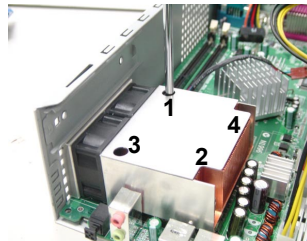
The CPU has been completely installed.



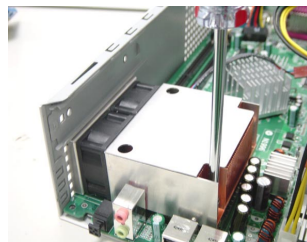
Put the cooler onto the CPU.



Use screws to secure the CPU cooler. Follow the sequence indicated to install screws.

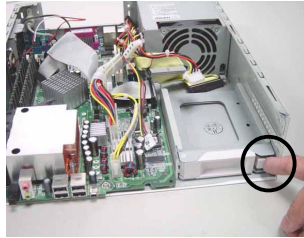


Install the 2nd screw.



3. Installing HDD

Flip the tray lever to release the tray.



Pull the lever in the direction indicated to take out the tray.



Insert the HDD module into the tray. Use 4 screws to secure the HDD module (+) ⚙.



Connect the cables (including HDD cable and power cord).



Chapter 3

Insert the HDD tray into the chassis and push the lever in the direction indicated to close the lever.

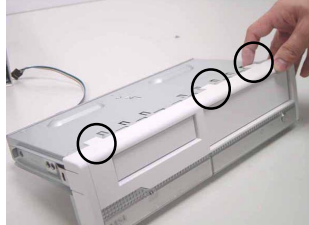


Press the place indicated to secure the tray.

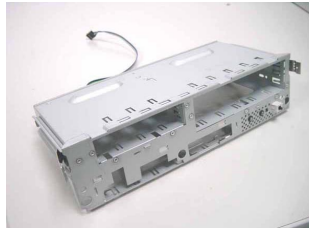


4. Installing FDD/Card Reader

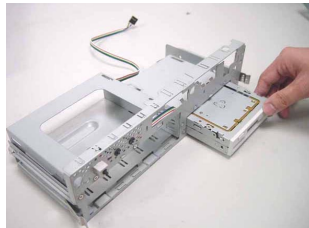
Flip the place indicated to take out the bracket of Front Panel Bezel.



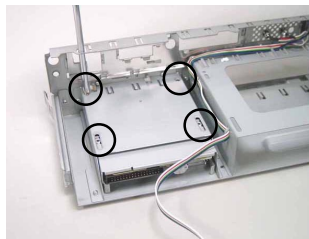
Reverse the Front Panel Bezel.



Option 1: Insert the FDD module into the Front Panel Bezel.



Use 4 screws   to secure the FDD module.



Option 2: Insert the Card Reader into the Front Panel Bezel.
(Connect the Card Reader cable before inserting & securing the Card Reader.)



Use 4 screws   to secure the Card Reader.



5. Installing CD-ROM

Insert the CD-ROM module into the Front Panel Bezel.

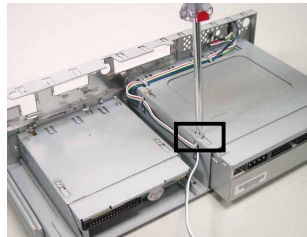


Use the screw   to secure the CD-ROM from the top.



Use the screw   to secure the CD-ROM from the top.



NOTE: There are three holes: I, E and S as indicated. Please insert the screw into the "I" hole.



Use the screw   to secure the CD-ROM from the right side.



Chapter 3

Use the screw   to secure the CD-ROM from the right side.
NOTE: *There are three holes: I, E and S as indicated. Please insert the screw into the "I" hole.*



6. Replacing Front Panel Bezel & Cover

Replace the bracket of Front Panel Bezel.



Replace the Front Panel Bezel.



Connect the Front Panel cable.



Connect the CD-ROM cable.



Chapter 3

Connect the CD-ROM power cord.



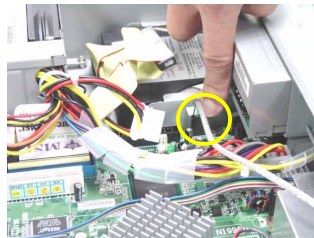
Option 1: Connect the FDD cable.



Connect the FDD power cord.



Option 2: Connect the Card Reader Cable.



Replace the riser card and use screws to secure it.

NOTE: Refer to p. 3-5, the reverse process of removing riser card.



Replace the cover.



Use two thumb screws to secure the cover.

NOTE: Refer to p. 3-5, the reverse process of removing cover.



Put the barebone on the footstand.



BIOS Setup **4**

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.

You may need to run the Setup program when:

- An error message appears on the screen during the system booting up, and requests you to run SETUP.
- You want to change the default settings for customized features.

4.1 ENTERING SETUP

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press key to enter Setup.

DEL:Setup F11:Boot Menu F12:Network boot TAB:Logo

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Selecting the First Boot Device

You are allowed to select the 1st boot device without entering the BIOS setup utility by pressing <F11>. When the same message as listed above appears on the screen, press <F11> to trigger the boot menu.

The POST messages might pass by too quickly for you to respond in time. If so, restart the system and press <F11> after around 2 or 3 seconds to activate the boot menu similar to the following.

Select First Boot Device		
Floppy	:	1st Floppy
IDE-0	:	IBM-DTLA-307038
CD-ROM	:	ATAPI CD-ROM DRIVE 40X M
[Up/Dn] Select	[RETURN] Boot	[ESC] cancel

The boot menu will list all the bootable devices. Select the one you want to boot from by using arrow keys and then pressing <Enter>. The system will boot from the selected device. The selection will not make changes to the settings in the BIOS setup utility, so next time when you power on the system, it will still use the original first boot device to boot up.

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F7>	Load BIOS Setup defaults
<F9>	Load optimal defaults
<F10>	Save all the CMOS changes and exit

Getting Help

After entering the Setup utility, the first screen you see is the Main Menu.

Main Menu

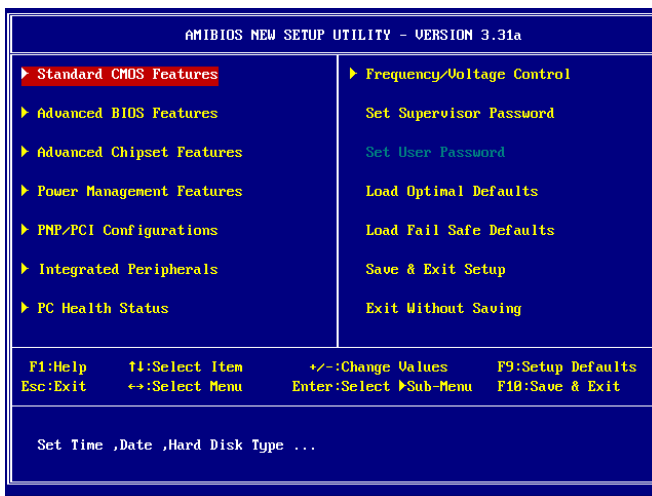
The main menu displays the setup categories the BIOS supplies. You can use the arrow keys (↑↓) to select the item. The on-line description for the selected setup category is displayed at the bottom of the screen.

Default Settings

The BIOS setup program contains two kinds of default settings: the BIOS Setup and High Performance defaults. BIOS Setup defaults provide stable performance settings for all devices and the system, while High Performance defaults provide the best system performance but may affect the system stability.

4.2 THE MAIN MENU

Once you enter AMIBIOS NEW SETUP UTILITY, the Main Menu will appear on the screen. The Main Menu displays twelve configurable functions and two exit choices. Use arrow keys to move among the items and press <Enter> to enter the submenu.



Standard CMOS Features

Use this menu for basic system configurations, such as time, date etc.

Advanced BIOS Features

Use this menu to setup the items of AMI® special enhanced features.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system's performance.

Power Management Features

Use this menu to specify your settings for power management.

PNP/PCI Configurations

This entry appears if your system supports PnP/PCI.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

PC Health Status

This entry shows your PC health status.

Frequency/Voltage Control

Use this menu to specify your settings for frequency/voltage control.

Set Supervisor Password

Use this menu to set Supervisor Password.

Set User Password

Use this menu to set User Password.

Load Optimal Defaults

Use this menu to load the BIOS values for the best system performance, but the system stability may be affected.

Load Fail Safe Defaults

Use this menu to load factory default settings into the BIOS for stable system performance operations.

Save & Exit Setup

Save changes to CMOS and exit setup.

Exit Without Saving

Abandon all changes and exit setup.

4.3 STANDARD CMOS FEATURES

The items inside STANDARD CMOS SETUP menu are divided into 9 categories. Each category includes none, one or more setup items. Use the arrow keys to highlight the item you want to modify and use the <PgUp> or <PgDn> keys to switch to the value you prefer.

AMIBIOS NEW SETUP UTILITY - VERSION 3.31a		
Standard CMOS Features		[Setup Help]
System Time	09:55:22	Time is 24 hour format Hour: 00 - 23 Minute: 00 - 59 Second: 00 - 59 (1:30AM = 01:30:00, 1:30PM = 13:30:00)
System Date	May 21 2003 Wed	
▶ Primary IDE Master	Not Installed	
▶ Primary IDE Slave	Not Installed	
▶ Secondary IDE Master		
▶ Secondary IDE Slave		
▶ Third IDE Master		
▶ Third IDE Slave		
Floppy Drive A	1.44 MB 3½	
Floppy Drive B	Not Installed	
F1:Help F4:Select Item +/-:Change Values F9:Setup Defaults		
Esc:Previous Menu Enter:Select ▶Sub-Menu F10:Save & Exit		

System Time

This allows you to set the system time that you want (usually the current time). The time format is <hour> <minute> <second>.

System Date

This allows you to set the system to the date that you want (usually the current date). The format is <day><month> <date> <year>.

day	Day of the week, from Sun to Sat, determined by BIOS. Read-only.
month	The month from Jan. through Dec.
date	The date from 1 to 31 can be keyed by numeric function keys.
year	The year can be adjusted by users.

Primary/Secondary/Third IDE Master/Slave

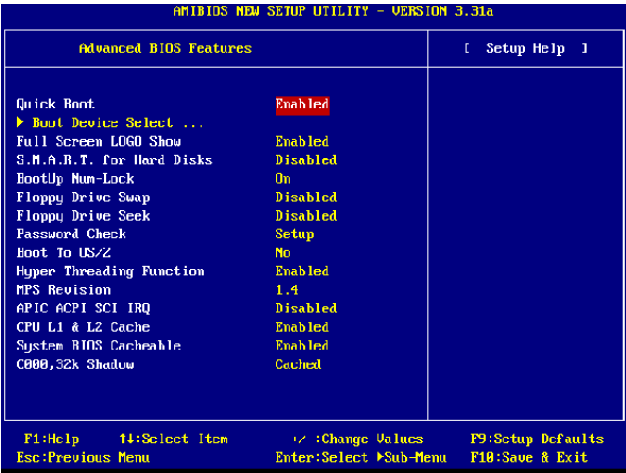
Press PgUp/<+> or PgDn/<-> to select the hard disk drive type. The specification of hard disk drive will show up on the right hand according to your selection.

Type	Select how to define the HDD parameters
Cylinders	Enter cylinder number
Heads	Enter head number
Write Precompensation	Enter write precomp cylinder
Sectors	Enter sector number
Maximum Capacity	Read the maximal HDD capacity
LBA Mode	Select <i>Auto</i> for a hard disk > 512 MB under Windows and DOS, or <i>Disabled</i> under Netware and UNIX
Block Mode	Select <i>Auto</i> to enhance the hard disk performance
Fast Programmed I/O Modes	Select <i>Auto</i> to enhance hard disk performance by optimizing the hard disk timing
32 Bit Transfer Mode	Enable 32 bit to maximize the IDE hard disk data transfer rate

Floppy Drive A:/B:

This item allows you to set the type of floppy drives installed. Available options: *Not Installed*, *1.2 MB 5¼*, *720 KB 3½*, *1.44 MB 3½* and *2.88 MB 3½*.

4.4 ADVANCED BIOS FEATURES

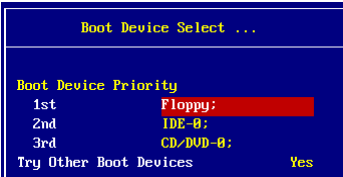


Quick Boot

Setting the item to *Enabled* allows the system to boot within 5 seconds since it will skip some check items. Available options: *Enabled, Disabled*.

Boot Device Select

Press <Enter> to enter the sub-menu screen.



Boot Device Priority: 1st/2nd/3rd

The items allow you to set the sequence of boot devices where AMIBIOS attempts to load the operating system. The settings are:

- IDE-0* The system will boot from the first HDD.
- IDE-1* The system will boot from the second HDD.
- IDE-2* The system will boot from the third HDD.
- IDE-3* The system will boot from the fourth HDD.
- Floppy* The system will boot from floppy drive.
- ARMD-FDD* The system will boot from any ARMD device, such as LS-120 or ZIP drive, that functions as a floppy drive.

<i>ARMD-HDD</i>	The system will boot from ARMD device, such as MO or ZIP drive, that functions as hard disk drive.
<i>CD/DVD</i>	The system will boot from the CD-ROM/DVD-ROM.
<i>Legacy SCSI</i>	The system will boot from the SCSI.
<i>Legacy NETWORK</i>	The system will boot from the Network drive.
<i>BBS-0</i>	The system will boot from the first BBS (BIOS Boot Specification) compliant device.
<i>BBS-1</i>	The system will boot from the second BBS (BIOS Boot Specification) compliant device.
<i>BBS-2</i>	The system will boot from the third BBS (BIOS Boot Specification) compliant device.
<i>BBS-3</i>	The system will boot from the fourth BBS (BIOS Boot Specification) compliant device.
<i>BBS-4</i>	The system will boot from the 5th BBS (BIOS Boot Specification) compliant device.
<i>BBS-5</i>	The system will boot from the 6th BBS (BIOS Boot Specification) compliant device.
<i>BBS-6</i>	The system will boot from the 7th BBS (BIOS Boot Specification) compliant device.
<i>BBS-7</i>	The system will boot from the 8th BBS (BIOS Boot Specification) compliant device.
<i>BBS-8</i>	The system will boot from the 9th BBS (BIOS Boot Specification) compliant device.
<i>BBS-9</i>	The system will boot from the 10 BBS (BIOS Boot Specification) compliant device.
<i>USB FDD</i>	The system will boot from USB-interfaced floppy drive.
<i>USB CD-ROM</i>	The system will boot from the USB-interfaced CD-ROM.
<i>USB HDD</i>	The system will boot from the USB-interfaced HDD.
<i>USB RMD-FDD</i>	The system will boot from any USB-interfaced ARMD device, such as LS-120 or ZIP drive, that functions as a floppy drive.
<i>USB RMD-HDD</i>	The system will boot from USB-interfaced ARMD device, such as MO or ZIP drive, that functions as hard disk drive.
<i>Disabled</i>	Disable this sequence



Available settings for “1st/2nd/3rd” boot device vary depending on the bootable devices you have installed. For example, if you did not install a floppy drive, the setting “Floppy” does not show up.

Try Other Boot Device

Setting the option to *Yes* allows the system to try to boot from other devices if the system fails to boot from the 1st/2nd/3rd boot device.

Full Screen LOGO Show

This item enables you to show the company logo on the bootup screen. Settings are:

<i>Enabled</i>	Shows a still image (logo) on the full screen at boot.
<i>Disabled</i>	Shows the POST messages at boot.

S.M.A.R.T. for Hard Disks

This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline. Settings: *Enabled, Disabled*.

BootUpNum-Lock

This item is to set the Num Lock status when the system is powered on. Setting to *On* will turn on the Num Lock key when the system is powered on. Setting to *Off* will allow end users to use the arrow keys on the numeric keypad. Setting options: *On, Off*.

Floppy Drive Swap

Setting to *Enabled* will swap floppy drives A: and B:.

Floppy Drive Seek

This setting causes the BIOS to search for floppy disk drives at boot time. When enabled, the BIOS will activate the floppy disk drives during the boot process: the drive activity light will come on and the head will move back and forth once. First A: will be done and then B: if it exists. Setting options: *Disabled, Enabled*.

Password Check

This specifies the type of AMIBIOS password protection that is implemented. Setting options are described below.

Option	Description
Setup	The password prompt appears only when end users try to run Setup.
Always	A password prompt appears every time when the computer is powered on or when end users try to run Setup.

Boot To OS/2

This allows you to run the OS/2® operating system with DRAM larger than 64MB. When you choose *No*, you cannot run the OS/2® operating system with DRAM larger than 64MB. But it is possible if you choose *Yes*.

Hyper Threading Function

This field is used to enable or disable the Hyper Threading function. Setting to Enabled will increase the system performance. Settings: *Enabled, Disabled*.



Enabling the functionality of Hyper-Threading Technology for your computer system requires ALL of the following platform Components:

- *CPU: An Intel® Pentium® 4 Processor with HT Technology;
- *Chipset: An Intel® Chipset that supports HT Technology;
- *BIOS: A BIOS that supports HT Technology and has it enabled; and
- *OS: An operating system that supports HT Technology.

For more information on Hyper-threading Technology, go to:
www.intel.com/info/hyperthreading

MPS Revision

This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. Settings: *1.4* and *1.1*.

Chapter 4

APIC ACPI SCI IRQ

This field is used to enable or disable the APIC (Advanced Programmable Interrupt Controller). Due to compliance to PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQs resources for the system. Settings: *Enabled* and *Disabled*.

CPU L1 & L2 Cache

Cache memory is additional memory that is much faster than conventional DRAM (system memory). When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. The setting controls the internal cache (also known as L1 or level 1 cache). Setting to *WriteBack* will speed up the system performance.

System BIOS Cacheable

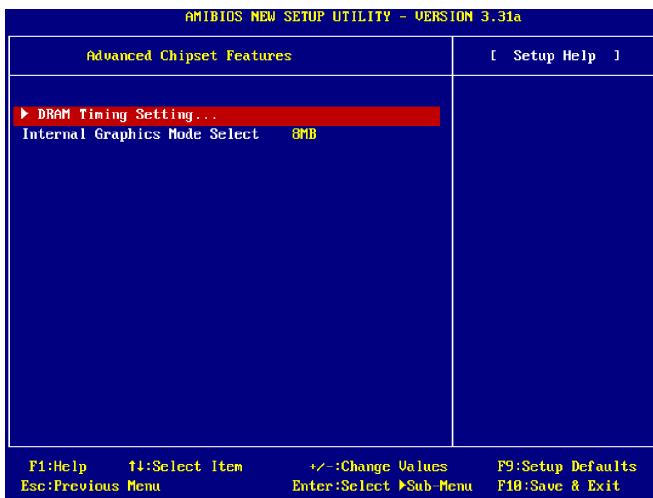
Selecting *Enabled* allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. Setting options: *Enabled*, *Disabled*.

C000, 32k Shadow

This item specifies how the contents of the adapter ROM named in the item are handled. Settings are described below:

Option	Description
Disabled	The specified ROM is not copied to RAM.
Enabled	The contents of specified ROM are copied to RAM for faster system performance.
Cached	The contents of specified ROM are not only copied to RAM, the contents of the ROM area can be written to and read from cache memory.

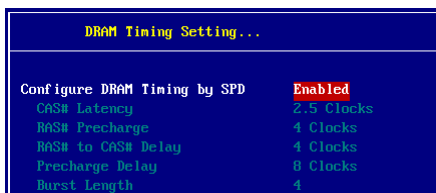
4.5 ADVANCED CHIPSET FEATURES



NOTE: Change these settings only if you are familiar with the chipset.

DRAM Timing Setting...

Press <Enter> and to enter the sub-menu screen.



Configure SDRAM Timing by SPD

Selects whether DRAM timing is controlled by the SPD (Serial Presence Detect) EEPROM on the DRAM module. Setting to *Enabled* enables the following fields automatically to be determined by BIOS based on the configurations on the SPD. Selecting *Disabled* allows users to configure these fields manually.

CAS# Latency

This controls the timing delay (in clock cycles) before SDRAM starts a read command after receiving it. Settings: 2, 2.5 (clocks). 2 (clocks) increases the system performance the most while 2.5 (clocks) provides the most stable performance.

RAS# Precharge

This item controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refresh may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system. Available settings: 2 *clocks*, 3 *clocks*, 4 *clocks*.

RAS# to CAS# Delay

When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance. Setting options: 2 *clocks*, 3 *clocks*, 4 *clocks*, .

Precharge Delay

This setting controls the precharge delay, which determines the timing delay for DRAM precharge. Settings: 5 *clocks*, 6 *clocks*, 7 *clocks*, 8*clocks*, .

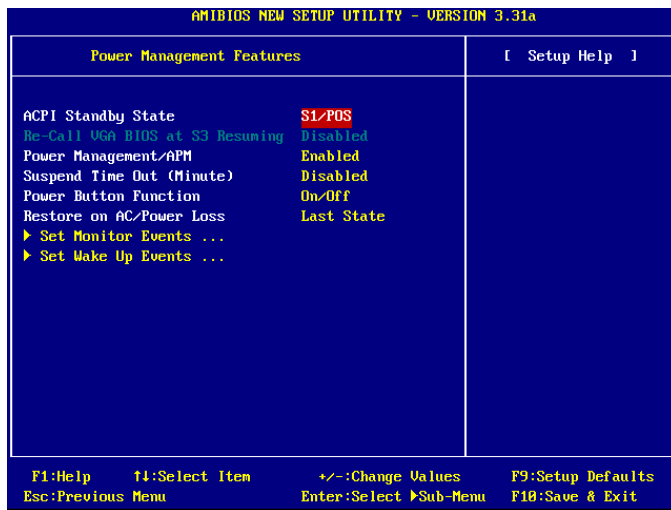
Burst Length

This setting allows you to set the size of Burst-Length for DRAM. Bursting feature is a technique that DRAM itself predicts the address of the next memory location to be accessed after the first address is accessed. To use the feature, you need to define the burst length, which is the actual length of burst plus the starting address and allows internal address counter to properly generate the next memory location. The bigger the size, the faster the DRAM performance. Available settings: 4, 8.

Internal Graphics Mode Select

The field specifies the size of system memory allocated for video memory. Settings: *Disabled*, 1MB, 8MB, 16MB.

4.6 POWER MANAGEMENT FEATURES



ACPI Standby State

This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 98SE, Windows ME and Windows 2000, you can choose to enter the Standby mode in S1(POS) or S3(STR) fashion through the setting of this field. Options are:

- | | |
|---------------|--|
| <i>S1/POS</i> | The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system context. |
| <i>S3/STR</i> | The S3 sleep mode is a lower power state where the information of system configuration and open applications/files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a “wake up” event occurs. |
| <i>Auto</i> | BIOS determines the best mode automatically. |

Chapter 4

Re-Call VGA BIOS at S3 Resuming

Selecting *Enabled* allows BIOS to call VGA BIOS to initialize the VGA card when system wakes up (resumes) from S3 sleep state. The system resume time is shortened when you disable the function, but system will need an AGP driver to initialize the VGA card. Therefore, if the AGP driver of the card does not support the initialization feature, the display may work abnormally or not function after resuming from S3.

Power Management/APM

Setting to *Enabled* will activate an Advanced Power Management (APM) device to enhance Max Saving mode and stop CPU internal clock. Settings: *Disabled, Enabled*.

Suspend Time Out (Minute)

After the selected period of system inactivity, all devices except the CPU shut off. Settings: *Disabled, 1, 2, 4, 8, 10, 20, 30, 40, 50, 60*.

Power Button Function

This feature sets the function of the power button. Settings are:

<i>On/Off</i>	The power button functions as normal power off button.
<i>Suspend</i>	When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

Restore on AC/Power Loss

This setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

<i>Power Off</i>	Leaves the computer in the power off state.
<i>Power On</i>	Leaves the computer in the power on state.
<i>Last State</i>	Restores the system to the previous status before power failure or interrupt occurred.

Set Monitor Events

Press <Enter> and the following submenu appears.

Set Monitor Events ...	
FDC/LPT/COM Ports	Monitor
Primary Master IDE	Monitor
Primary Slave IDE	Ignore
Secondary Master IDE	Monitor
Secondary Slave IDE	Ignore

FDC/LPT/COM Ports, Primary/Secondary Master/Slave IDE

These items specify if the BIOS will monitor the activity of the specified hardware peripherals or components. If set to *Monitor*, any activity detected on the specified hardware peripherals or components will wake up the system or prevent the system from entering the power saving modes. Settings: *Monitor*, *Ignore*.

Set WakeUp Events

Press <Enter> and the following submenu appears.

Set Wake Up Events ...	
USB Device Wakeup From S3	Disabled
Keyboard Wake Up From S3	Disabled
Mouse Wake Up From S3	Disabled
Resume On Ring	Disabled
Resume On PME#	Enabled
Resume On RTC Alarm	Disabled
RTC Alarm Date	15
RTC Alarm Hour	12
RTC Alarm Minute	30
RTC Alarm Second	30

USB Device Wakeup From S3

This item allows the activity of the USB devices (keyboard and mouse) to wake up the system from S3 sleep state. Setting: *Enabled*, *Disabled*.

Keyboard/Mouse Wake up From S3, Resume on Ring

These two fields specify whether the system will be awakened from power saving modes when activity or input signal of the specified hardware peripheral or component is detected.

- In “Keyboard Wake up From S3”, you have two options: “any key” & “disabled”. Selecting “any key” allows you to power on the system by pressing any key.
- In “Mouse Wake up From S3”, you have two options: “disabled” & “enabled”. Selecting “enabled” allows you to power on the system by clicking on the mouse.

- You need to install a modem card supporting power on function for “Resume On Ring” function.

Resume On PME#

This field specifies whether the system will be awakened from power saving modes when activity or input signal of the specified hardware peripheral or component is detected. Settings: *Enabled, Disabled*.

Resume By RTC Alarm

This is used to enable or disable the feature of booting up the system on a scheduled time/date from the soft off (S5) state. Settings: *Enabled, Disabled*.

RTC Alarm Date/Hour/Minute/Second

If *Resume By Alarm* is set to *Enabled*, the system will automatically resume (boot up) on a specific date/hour/minute/second specified in these fields. Available settings for each item are:

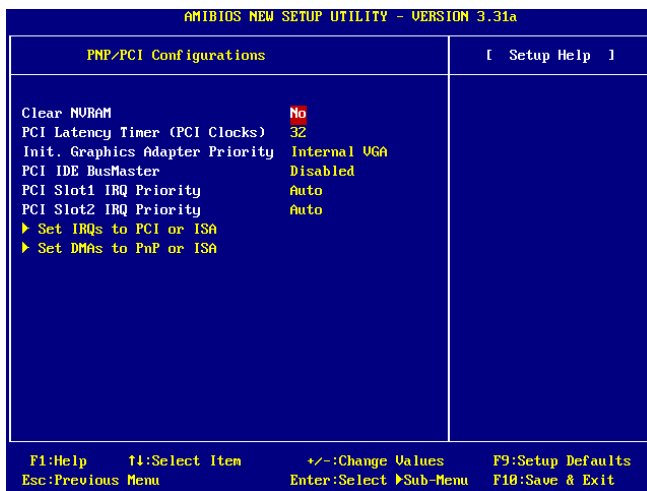
Alarm Date	01 ~ 31, Every Day
Alarm Hour	00 ~ 23
Alarm Minute	00 ~ 59
Alarm Second	00 ~ 59



If you have changed this setting, you must let the system boot up until it enters the operating system, before this function will work.

4.7 PNP/PCI CONFIGURATIONS

This section describes configuring the PCI bus system and PnP (Plug & Play) feature. PCI, or **P**eripheral **C**omponent **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.



Clear NVRAM

The ESCD (Extended System Configuration Data) NVRAM (Nonvolatile Random Access Memory) is where the BIOS stores resource information for both PNP and non-PNP devices in a bit string format. When the item is set to *Yes*, the system will reset ESCD NVRAM right after the system is booted up and then set the setting of the item back to *No* automatically.

PCI Latency Timer (PCI Clocks)

This item controls how long each PCI device can hold the bus before another takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth. For better PCI performance, you should set the item to higher values. Settings range from 32 to 248 at a 32 increment.

Chapter 4

Init. Graphics Adapter Priority

This setting specifies which VGA card is your primary graphics adapter. Setting options are:

Internal VGA The system initializes the onboard VGA device.

PCI/Int-VGA The system initializes the installed PCI VGA card first. If a PCI VGA card is not available, it will initialize the onboard VGA device.

PCI IDE BusMaster

Set this option to *Enabled* to specify that the IDE controller on the PCI local bus has bus mastering capability. Setting options: *Disabled, Enabled*.

PCI Slot1 IRQ Priority, PCI Slot2 IRQ Priority

These items specify the IRQ line for each PCI slot. Setting options: *3, 4, 5, 7, 9, 10, 11, Auto*. Selecting *Auto* allows BIOS to automatically determine the IRQ line for each PCI slot.

Set IRQs to PCI or ISA

Press <Enter> to enter the sub-menu and the following screen appears:

Set IRQs to PCI or ISA	
IRQ3	PCI/PnP
IRQ4	PCI/PnP
IRQ5	PCI/PnP
IRQ7	PCI/PnP
IRQ9	PCI/PnP
IRQ10	PCI/PnP
IRQ11	PCI/PnP
IRQ14	PCI/PnP
IRQ15	PCI/PnP

IRQ 3/4/5/7/9/10/11/14/15

These items specify the bus where the specified IRQ line is used. The settings determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the IRQ pool, the end user can use these settings to reserve the IRQ by assigning an *ISA/EISA* setting to it. Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as *PCI/PnP*. If all IRQs are set to *ISA/EISA*, and IRQ 14/15 are allocated to the onboard PCI IDE, IRQ 9 will still be available for PCI and PnP devices. Available settings: *ISA/EISA* and *PCI/PnP*.

Set DMAs to PnP or ISA

Press <Enter> to enter the sub-menu and the following screen appears:

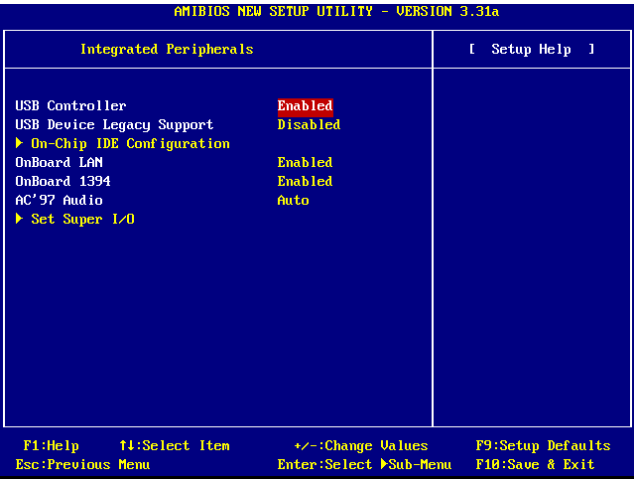
Set DMAs to PnP or ISA	
DMA Channel 0	PnP
DMA Channel 1	PnP
DMA Channel 3	PnP
DMA Channel 5	PnP
DMA Channel 6	PnP
DMA Channel 7	PnP

DMA Channel 0/1/3/5/6/7

These items specify the bus that the system DMA (Direct Memory Access) channel is used.

The settings determine if AMIBIOS should remove a DMA from the available DMAs passed to devices that are configurable by the system BIOS. The available DMA pool is determined by reading the ESCD NVRAM. If more DMAs must be removed from the pool, the end user can reserve the DMA by assigning an *ISA/EISA* setting to it.

4.8 INTEGRATED PERIPHERALS



USB Controller

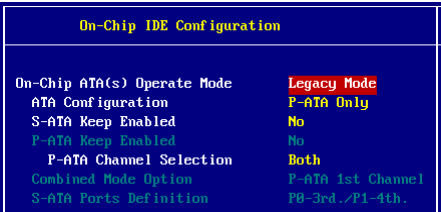
This setting is used to enable/disable the onboard USB controllers.

USB Device Legacy Support

Set to *Enabled* if your need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix. Setting options: *Disabled, Enabled*.

On-Chip IDE Configuration

Press <Enter> to enter the sub-menu and the following screen appears:



On-Chip ATA(s) Operate Mode

This setting allows you to determine how the RAID controller on the south bridge is going to switch to SATA controller. *Legacy Mode* means you may use the traditional 14 and 15 IRQs, while *Native Mode* means you may use all the available IRQs. Setting options: *Legacy Mode*, *Native Mode*.

There are two modes to select: Legacy mode and Native mode.

Legacy Mode:

--- In this mode, system BIOS just assign the traditional 14 and 15 IRQs to use for HDD.

--- Older OSs that do not support switch to Native Mode (DOS, Win2K, Win98/ME...) should set SATA and PATA to Legacy Mode.

--- Maximum 4 ATA devices to connect.

--- Combine mode and Non-Combine mode.

➤ *Non-Combined Mode: P-ATA devices only .*

Maximum of 4 devices.

➤ *Non-Combined Mode: S-ATA devices only.*

Maximum of 2 devices.

➤ *Combined Mode: S-ATA devices*

P-ATA devices

*Maximum of 2 devices each, thus total
4 devices at maximum.*

Native Mode:

--- In this mode, system BIOS will search all available IRQs to use for HDD.

--- New OS that support switch to Native Mode (WinXP, Windows .NET Server) can set SATA and PATA to Native Mode.

--- Comprehend both Legacy and/or Native Modes.

--- Maximum 6 ATA devices to connect (4 for P-ATA & 2 for S-ATA).

Chapter 4

ATA Configuration

The field lets you to configure the available ATA controller. Setting options: *Disabled, P-ATA Only, S-ATA Only, P-ATA+S-ATA*.

S-ATA Keep Enabled

This item is available for you to enable/disable the onboard S-ATA. Setting options: *Yes, No*.

P-ATA Keep Enabled

This item is available for you to enable/disable the onboard P-ATA. Setting options: *Yes, No*.

P-ATA Channel Selection

This item is available for you to select the parallel ATA channel. Setting options: *Primary, Secondary, Both*.

Combined Mode Option

This item is available for you to select the combined mode of the ATA controllers. Setting options: *P-ATA 1st Channel, S-ATA 1st Channel*.

S-ATA Ports Definition

This allows you to set the boot sequence of serial ATA ports.

Onboard LAN/1394

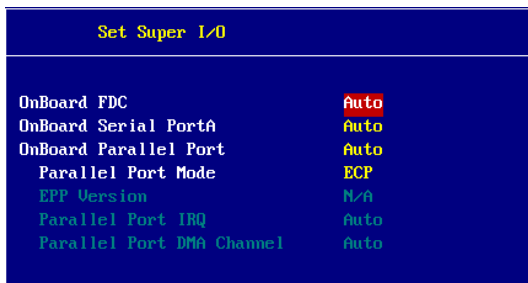
This item is used to enable/disable the onboard LAN/1394 controllers. Setting: *Enabled, Disabled*.

AC97 Audio

Auto allows the motherboard's BIOS to detect whether you're using any audio device. If so, the onboard audio controller will be enabled. If not, the onboard audio controller will be disabled. If you want to use different controller cards to connect audio connectors, set the field to *Disabled*. Setting options: *Disabled, Auto*.

Set Super I/O

Press <Enter> to enter the sub-menu and the following screen appears:



OnBoard FDC

Select Enabled if your system has a floppy disk controller (FDD) installed on the system board and you wish to use it.

Option	Description
Auto	BIOS will automatically determine whether to enable the onboard Floppy controller or not.
Enabled	Enables the onboard Floppy controller.
Disabled	Disables the onboard Floppy controller.

Onboard Serial Port A

These items specify the base I/O port addresses of the onboard Serial Port 1 (COM A). Selecting *Auto* allows AMIBIOS to automatically determine the correct base I/O port address. Settings: *Auto*, *3F8/COM1*, *2F8/COM2*, *3E8/COM3*, *2E8/COM4* and *Disabled*.

Onboard Parallel Port

This field specifies the base I/O port address of the onboard parallel port. Selecting *Auto* allows AMIBIOS to automatically determine the correct base I/O port address. Settings: *Auto*, *378*, *278*, *3BC* and *Disabled*.

Parallel Port Mode

This item selects the operation mode for the onboard parallel port: *ECP*, *Normal*, *Bi-Dir* or *EPP*.

Chapter 4

EPP Version

The item selects the EPP version used by the parallel port if the port is set to *EPP* mode. Settings: *1.7* and *1.9*.

Parallel Port IRQ

When *Onboard Parallel Port* is set to *Auto*, the item shows *Auto* indicating that BIOS determines the IRQ for the parallel port automatically.

Parallel Port DMA Channel

This feature needs to be configured only when *Parallel Port Mode* is set to the *ECP* mode. When Parallel Port is set to *Auto*, the field will show *Auto* indicating that BIOS automatically determines the DMA channel for the parallel port.

4.9 PC HEALTH STATUS

This section shows the status of your CPU, fan, overall system status, etc. Monitor function is available only if there is hardware monitoring mechanism onboard.

PC Health Status		[Setup Help]
Chassis Intrusion	Disabled	
Smart Fan Control Function	Enabled	
CPU Temperature	1°C/33°F	
System Temperature	8°C/32°F	
CPU Fan Speed		
System Fan Speed		
F1:Help F4:Select Item +/-:Change Values F9:Setup Defaults Esc:Previous Menu Enter:Select ▶Sub-Menu F10:Save & Exit		

Chassis Intrusion

The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to *Reset*. The setting of the field will automatically return to *Enabled* later. Settings: *Enabled, Reset, Disabled*.

Smart Fan Control Function

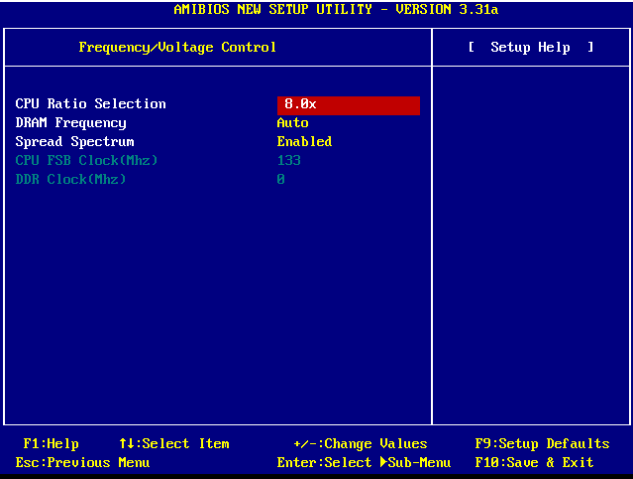
This field enables or disables smart fan control function. If you choose “enable”, CPU fan and system fan speed will depend on CPU temperature. When CPU temperature is high, the fan will spin quickly. This function will reduce the noise that produced by fan. If you disable it, the CPU fan and system fan will spin in full speed. We recommend users to enable it.

CPU/System Temperature, CPU/System Fan Speed

These items display the current status of the monitored hardware devices/components.

4.10 FREQUENCY/VOLTAGE CONTROL

Use this menu to specify your settings for frequency/voltage control.



CPU Ratio Selection

This setting controls the multiplier that is used to determine the internal clock speed of the processor relative to the external or motherboard clock speed.

DRAM Frequency

Use this field to configure the clock frequency of the installed DRAM. Settings are:

- PSB 400: 266, Auto.
- PSB 533: 266, 333, Auto.
- PSB 800: 266, 333, 400, Auto.

Spread Spectrum

When the motherboard’s clock generator pulses, the extreme values (spikes) of the pulses creates EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves. If you do not have any EMI problem, leave the setting at *No* for optimal system stability and performance. But if you are plagued by EMI, setting to *Enabled* for EMI reduction. Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clockspeed which may just cause your overclocked processor to lock up.

CPU FSB Clock (Mhz)

Just for information. It doesn't allow you to make any setting.

DDR Clock (Mhz)

Just for information. It doesn't allow you to make any setting.

4.11 SUPERVISOR/USER PASSWORD

When you select this function, a message as below will appear on the screen:



Type the password, up to six characters in length, and press <Enter>. The password typed now will replace any previously set password from CMOS memory. You will be prompted to confirm the password. Retype the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.

When a password has been set, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also have AMIBIOS to request a password each time the system is booted. This would prevent unauthorized use of your computer. The setting to determine when the password prompt is required is the PASSWORD CHECK option of the ADVANCED BIOS FEATURES menu. If the PASSWORD CHECK option is set to *Always*, the password is required both at boot and at entry to Setup. If set to *Setup*, password prompt only occurs when you try to enter Setup.



About Supervisor Password & User Password:

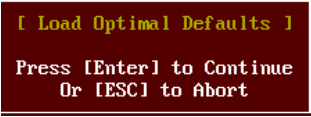
Supervisor password: Can enter and change the settings of the setup menu.

User password: Can only enter but do not have the right to change the settings of

4.12 OPTIMAL/FAIL SAFE DEFAULTS

The two options on the main menu allow users to restore all of the BIOS settings to Optimal defaults or Fail Safe defaults. The Optimal Defaults are the default values set by the mainboard manufacturer for the best system performance but probably will cause a stability issue. The Fail Safe Defaults are the default values set by the mainboard manufacturer for stable performance of the mainboard.


When you select Load Optimal Defaults, a message as below appears:

A screenshot of a BIOS screen with a black background and yellow text. The text is centered and reads: "[Load Optimal Defaults]", "Press [Enter] to Continue", and "Or [ESC] to Abort".

```
[ Load Optimal Defaults ]  
Press [Enter] to Continue  
Or [ESC] to Abort
```

Pressing 'Y' loads the default values that are factory settings for stable system performance.

When you select Fail Safe Defaults, a message as below appears:

A screenshot of a BIOS screen with a red background and yellow text. The text is centered and reads: "[Load fail safe settings]", "Press [Enter] to Continue", and "Or [ESC] to Abort".

```
[ Load fail safe settings ]  
Press [Enter] to Continue  
Or [ESC] to Abort
```

Pressing 'Y' loads the default BIOS values that enable the best system performance but may lead to a stability issue.

Appendix: Using 4- or 6-Channel Audio Function

The motherboard is equipped with Realtek ALC650 chip, which provides support for 6-channel audio output, including 2 Front, 2 Rear, 1 Center and 1 Subwoofer channel. ALC650 allows the board to attach 4 or 6 speakers for better surround sound effect. The section will tell you how to install and use 4-/6-channel audio function on the board.

Installing the Audio Driver

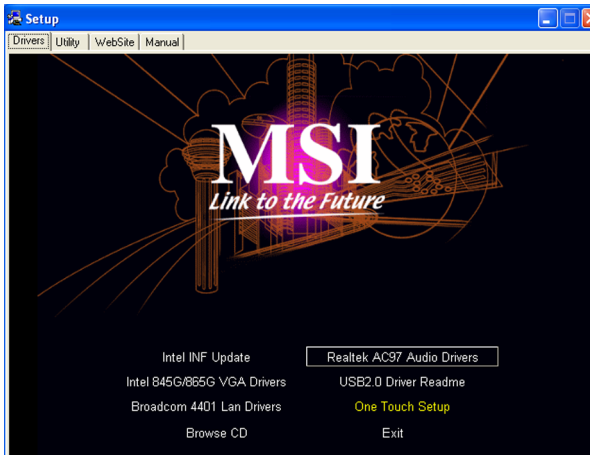
You need to install the driver for Realtek ALC650 chip to function properly before you can get access to 4-/6-channel audio operations. Follow the procedures described below to install the drivers for different operating systems.

Installation for Windows 98SE/ME/2000/XP

For Windows® 2000, you must install Windows® 2000 Service Pack2 or later before installing the driver.

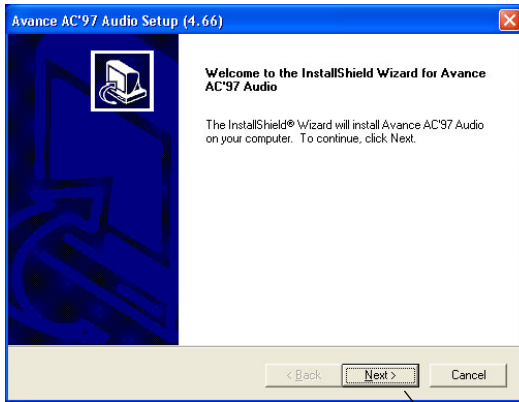
The following illustrations are based on Windows® XP environment and could look slightly different if you install the drivers in different operating systems.

1. Insert the companion CD into the CD-ROM drive. The setup screen will automatically appear.
2. Click **Realtek AC97 Audio Drivers**.



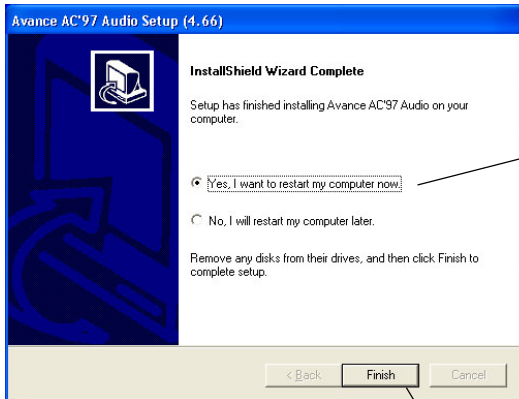
3. Click **Next** to start installing files into the system.

Using 4- or 6-Channel Audio Function



Click here

4. Click **Finish** to restart the system.



Select this option


Click here

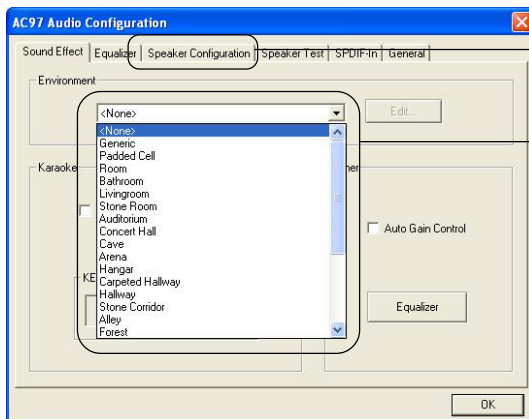
Using 4- or 6- Channel Audio Function

In addition to a default 2-Channel analog audio output function, the audio connectors on the Back Panel also provide 4- or 6-Channel analog audio output function if a proper setting is made in the software utility.

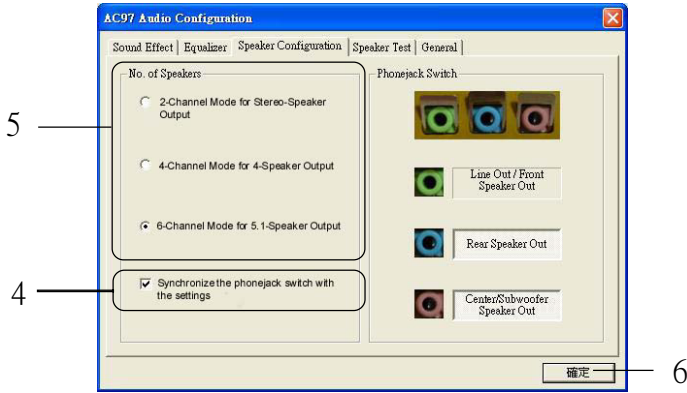
Read the following steps to have the Multi-Channel Audio Function properly set in the software utility, and have your speakers correctly connected to the Back Panel:

Configuration in the Software Utility

1. Click the audio icon  from the window tray at the lower-right corner of the screen.
2. Select a desired surround sound effect from the “Environment” drop-down menu.
3. Click the **Speaker Configuration** tab.
4. Select **Synchronize the phonejack switch with the settings**.
5. Select a desired multi-channel operation from **No. of Speakers**.
 - a. 2-Channel Mode for Stereo-Speaker Output
 - b. 4-Channel Mode for 4-Speaker Output
 - c. 6-Channels Mode for 5.1-Speaker Output
6. Click **OK** to close this window.



Using 4- or 6-Channel Audio Function

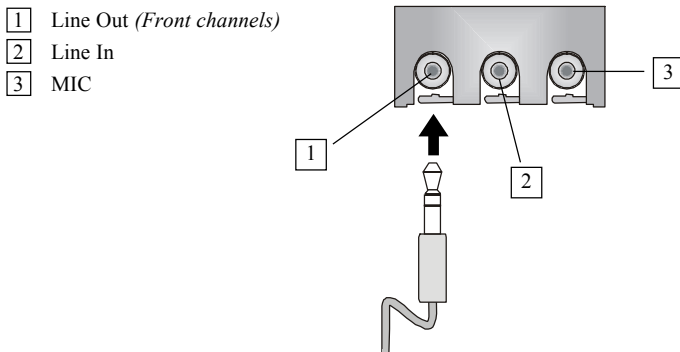


Connecting the Speakers

When you have set the Multi-Channel Audio Function mode properly in the software utility, connect your speakers to the correct phonejacks in accordance with the setting in software utility.

■ 2-Channel Mode for Stereo-Speaker Output

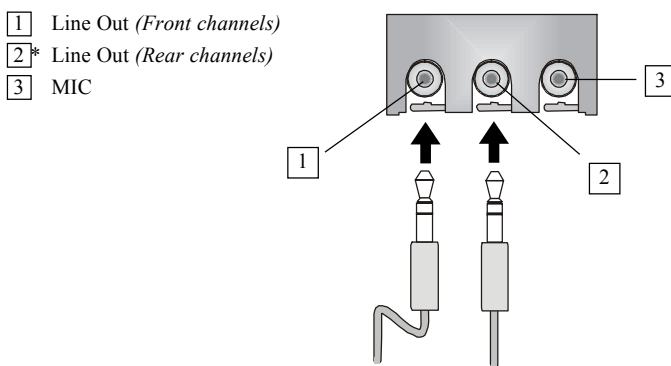
Refer to the following diagram and caption for the function of each phonejack on the back panel when 2-Channel mode is selected.



■ **4-Channel Mode for 4-Speaker Output**

The audio jacks on the back panel always provide 2-Channel analog audio output function, however these audio jacks can be transformed to 4- or 6- channels analog audio jacks by selecting the corresponding multi-channel operation from **No. of Speakers**.

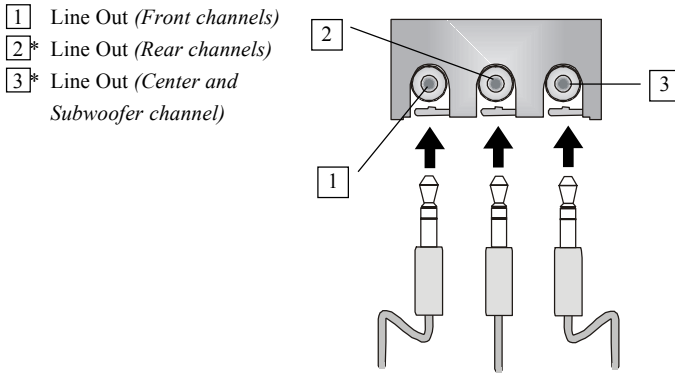
Refer to the following diagram and caption for the function of each jack on the back panel when 4-Channels mode is selected.



* Line In function is converted to Line Out function when 4-Channel Mode for 4-Speaker Output is selected.

■ **6-Channel Mode for 6-Speaker Output**

Refer to the following diagram and caption for the function of each jack on the back panel when 6-Channels mode is selected.



* Both Line In and MIC function are converted to Line Out function when 4-Channel Mode for 6-Speaker Output is selected.




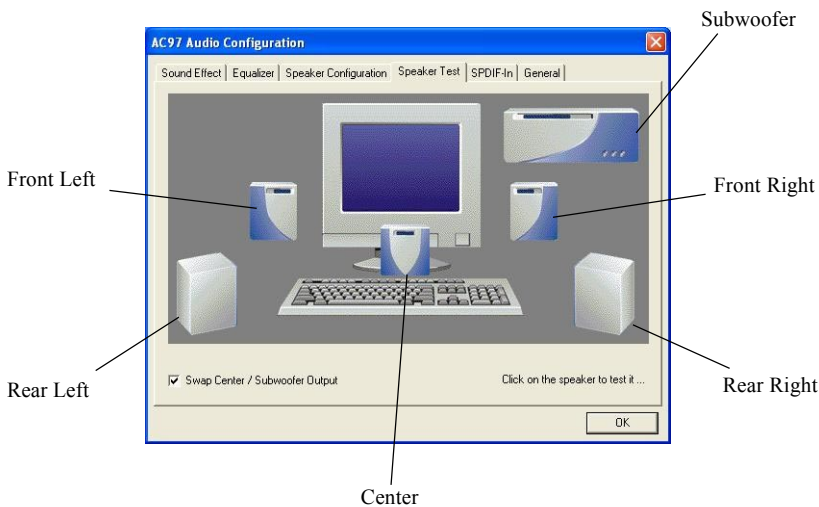
If the Center and Subwoofer speaker exchange their audio channels when you play video or music on the computer, a converter may be required to exchange center and subwoofer audio signals. You can purchase the converter from a speaker store .

Testing the Connected Speakers

To ensure that 4- or 6-channel audio operation works properly, you may need to test each connected speaker to make sure every speaker work properly. If any speaker fails to sound, then check whether the cable is inserted firmly to the connector or replace the bad speakers with good ones.

Testing Each Speaker:

1. Click the audio icon  from the window tray at the lower-right corner of the screen.
2. Click the **Speaker Test** tab.
3. The following window appears. Select the speaker which you want to test by clicking it.



6 speakers appear on the “Speaker Test” window only when you select “6-Channel Mode” in the “No. of Speakers” column. If you select “4-Channel Mode”, only 4 speakers appear on the window.

Using 4- or 6-Channel Audio Function

4. While you are testing the speakers in 6-Channel mode, if the sound coming from the center speaker and subwoofer is swapped, you should select **Swap Center/Subwoofer Output** to readjust these two channels .




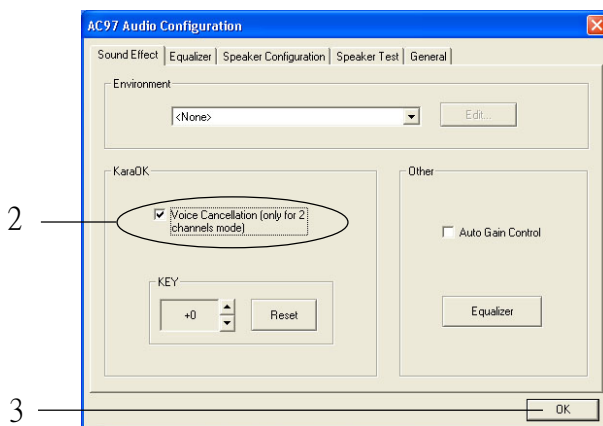
Select this function

Playing KaraOK

The KaraOK function will automatically remove human voice (lyrics) and leave melody for you to sing the song. Note that this function applies only for 2-channel audio operation.

Playing KaraOK:

1. Click the audio icon  from the window tray at the lower-right corner of the screen.
2. In the Sound Effect tab, select **Voice Cancellation** under “KaraOK.”
3. Click **OK** to close this window.



Glossary

ACPI (*Advanced Configuration & Power Interface*)

This power management specification enables the OS (operating system) to control the amount of power given to each device attached to the computer. Windows 98/98SE, Windows 2000 and Windows ME can fully support ACPI to allow users managing the system power flexibly.

AGP (*Accelerated Graphics Port*)

A new, high-speed graphics interface that based on PCI construction and designed especially for the throughput demands of 3-D graphics. AGP provides a direct channel (32-bit wide bus) between the display controller and main memory for high graphics quality and performance.

BIOS (*Basic Input/Output System*)

On PCs, an essential software that contains all the control code of input/output interface (such as keyboard, disk drives, etc.). It executes hardware test on booting the system, starts the OS, and provides an interface between the OS and the components. The BIOS is stored in a ROM chip.

Bus

A set of hardware lines within the computer system, through which the data is transferred among different components. In a PC, the term **bus** usually refers to a local bus that connects the internal components to the CPU and main memory.

Cache

A special memory subsystem that is used to speed up the data transfer. It stores the contents of frequently accessed RAM locations and the addresses where these data items are stored.

Chipset

A collection of integrated chips designed to perform one or more related functions. For example, a modem chipset contains all the primary circuits for transmitting and receiving data; a PC chipset provides the electronic interfaces between all subsystems.

CMOS (*Complementary Metal-Oxide Semiconductor*)

CMOS is a widely used type of semiconductor, which features high speed and low

power consumption. PCs usually contain a small amount of battery-powered CMOS memory to retain the date, time, and system setup parameters.

DRAM (*Dynamic RAM*)

A most common type of computer memory. It usually uses one transistor and a capacitor to represent a bit. As the development of technology, the memory type and specification used in computer becomes variety, such as SDRAM, DDR SDRAM, and RDRAM. For further instruction, please see the table below:

Dynamic RAM (DRAM) Memory Technologies					
Type	First Used	Clock Rate	Bus* Width	Peak Bandwidth	Volts
FPM (60,70ns)	1990	25MHz	64 bits	200 MBps	5v
EDO (50,60,70ns)	1994	40MHz	64 bits	320 MBps	5v
SDRAM (66MHz)	1996	66MHz	64 bits	528 MBps	3.3v
SDRAM (100MHz)	1998	100MHz	64 bits	800 MBps	3.3v
SDRAM (133MHz)	1999	133MHz	64 bits	1.1 GBps	3.3v
RDRAM (Direct Rambus)	1999	400MHz	16 bits	1.6 GBps	2.5v
DDR SDRAM (100MHz)	2000	100MHz	64 bits	1.6 GBps	3.3v
DDR SDRAM (133MHz)	2000	133MHz	64 bits	2.1 GBps	3.3v
* Memory channel width (64 bits started with 75MHz Pentium)					

Source: *Computer Desktop Encyclopedia*

DVI

1) Short for **Digital Visual Interface**, a digital interface standard created by the Digital Display Working Group (DDWG) to convert analog signals into digital signals to accommodate both analog and digital monitors.

2) Short for **Digital Video Interactive**, a now-defunct technology developed by General Electric that enables a computer to store and display moving video images like those on television.

IDE (*Integrated Drive Electronics*)

A type of disk-drive interface widely used to connect hard disks, CD-ROMs and tape drives to a PC, in which the controller electronics is integrated into the drive itself, eliminating the need for a separate adapter card. The IDE interface is known as the ATA (AT Attachment) specification.

IEEE 1394

A new, high speed external bus standard, also known as **FireWire** or **iLink**, which

supports data transfer rates of up to 400 Mbps for connecting up to 63 external devices.

IrDA (*Infrared Data Association*)

A group of device vendors, including computer, component and telecommunications, who have developed a standard for transmitting data via infrared light waves. This enables you to transfer data from one device to another without any cables.

IRQ (*Interrupt Request Line*)

IRQs are hardware lines over which devices can send interrupt signals to the microprocessor. When you add a new device to a PC, you sometimes need to set its IRQ number by setting a DIP switch. This specifies which interrupt line the device may use. IRQ conflicts used to be a common problem when adding expansion boards, but the Plug-and-Play specification has removed this headache in most cases.

LAN (*Local Area Network*)

A computer network that covers a relatively smaller area, such as in a building or an enterprise. It is made up of servers, workstations, shared resources, a network operating system and a communications link. These individual PCs and devices on a LAN are known as “nodes”, and are connected by cables to access data and devices anywhere on the LAN, so that many users can share expensive devices and data.

LED (*Light Emitting Diode*)

A semiconductor device that converts electrical energy into light. Since it lights up (usually red) when electricity is passed through it, it is usually used for the activity lights on computer’s component, such as disk drivers.

LPT (*Line Printer Terminal*)

Logical device name for a line printer; a name reserved by the MS-DOS for up to three parallel printer ports: LPT1, LPT2, and LPT3. It is frequently used by the OS to identify a printer.

PCI (*Peripheral Component Interconnect*)

A local bus standard developed by Intel that first appeared on PCs in late 1993. PCI provides “plug and play” capability and allows IRQs to be shared. The PCI controller can exchange data with the system's CPU either 32 bits or 64 bits at a time.

PCMCIA

Short for *Personal Computer Memory Card International Association*, PCMCIA is an

organization consisting of some 500 companies that has developed a standard for small , credit card-sized devices, called PC Cards. Originally designed for adding memory to portable computers, the PCMCIA standard has been expanded several times and is now suitable for many types of devices.

PnP (*Plug and Play*)

A set of specifications that allows a PC to configure itself automatically to work with peripherals. The user can "plug" in a peripheral device and "play" it without configuring the system manually. To implement this useful feature, both the BIOS that supports PnP and a PnP expansion card are required.

POST (*Power On Self Test*)

During booting up your system, the BIOS executes a series of diagnostic tests, include checking the RAM, the keyboard, the disk drives, etc., to see if they are properly connected and operating.

PS/2 Port

A type of port developed by IBM for connecting a mouse or keyboard to a PC. The PS/2 port supports a mini DIN plug containing just 6 pins. Most modern PCs equipped with PS/2 ports so that the special port can be used by another device, such as a modem.

SPDIF

Short for Sony/Philips Digital Interface, a standard audio file transfer format. Developed jointly by the Sony and Philips corporations, SPDIF allows the transfer of digital audio signals from one device to another without having to be converted first to an analog format.

USB (*Universal Serial Bus*)

A hardware interface for low-speed peripherals such as the keyboard, mouse, joystick, etc. USB provides a maximum bandwidth of 12 Mbit/sec (Mbps) for connecting up to 127 peripheral devices to PC. USB features hot swap capability and multiple data streams, allows external devices to be plugged in and unplugged without turning the system off.